

# FLIGHT

## The AIRCRAFT ENGINEER AND AIRSHIPS

First Aeronautical Weekly in the World. Founded January, 1909

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport

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## EDITORIAL COMMENT



### The New Air Minister

OUR new Air Minister is to be Lord Amulree, G.B.E., K.C., who was known up to July last year as Sir William Warrender Mackenzie. He is a man unknown in aeronautical circles, but in the special circumstances of the case we regard that, perhaps, as a recommendation rather than as a disadvantage. The Prime Minister was in a difficult position in choosing a successor to Lord Thomson, and we think that he has solved the problem very well. People who profess to understand politics tell us that the length of time which the present Government will endure may not be very long. If that be so, there was no need for the new Air Minister to initiate a policy for the Royal Air Force or for civil flying. It would not matter in the least if his mind on both those subjects were a complete blank—as almost any man's mind must be until he has spent a considerable time in studying these matters. The urgent necessity of the moment is to have an Air Minister to play a proper part in connection with the enquiry into the loss of R 101. A man was needed who could and would study the report of the experts, when it is presented, with an open mind, free from any prepossessions, who would study the evidence, and sum up the situation. The work has to be done rapidly, for the Premiers and representatives of the Dominions and India are now in London, and they are all intensely interested in what is a question of Empire communications. Canada and India have already spent money on erecting mooring towers, and South Africa and Australia have gone so far as selecting prospective sites for towers. The Imperial Conference will naturally want to know how the matter stands after the disaster to R 101. They will want to know, not only what is the attitude of the British Cabinet towards airship development policy, but also the facts on which their own countries may formulate a policy. Though the Government of Great Britain has so far spent by far the largest sums on the airship experiment, as was natural and proper, the question is not a domestic one but an Imperial one; and the

### DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list—

1930

Oct. 18	.. Reunion Supper of 28 Sqdn. (R.A.F.) Old Boys' Association, at White Horse, High Holborn.
Oct. 21	.. Society of Engineers' Dinner to Miss Amy Johnson, at Holborn Restaurant.
Oct. 23	.. Lecture, "Air Transport in Fog," by F. W. Meredith, before R.Ae.S.
Oct. 25	.. Meeting of Assoc. of Northern Gliding Clubs, Hotel Metropole, Leeds.
Nov. 13	.. Lecture, "Testing the Control of Aeroplanes," by H. L. Stevens, before R.Ae.S.
Nov. 20	.. Lecture, "Recent Developments in Engine Cooling," by Capt. H. Swan, before R.Ae.S.
Nov. 25	.. Norfolk and Norwich Ae.C. Annual Ball, Andrews Hall, Norwich.
Dec. 4	.. Lecture, "The Four-Foot Wind Tunnel," by H. Glauert, before R.Ae.S.
Dec. 11	.. Lecture, "Axial Engines," by M. L. Bramson, before R.Ae.S.
Nov. 28- Dec. 14	Paris Aero Show.
1932 May 31	.. Closing date for Cellon Cross-Channel Glide £1,000 Prize.

opinions of the other parts of the Empire will be awaited with the greatest interest. The Premiers are not aeronautical experts, but they are able and practical statesmen and men of affairs. Before they form their opinions they will need to have the facts put before them and summed up in a proper judicial manner. It would have been unfortunate if the new Air Minister had been a man who had already more or less formed opinions on the merits or demerits of airships. He would not have been able to treat the report in a duly impartial and judicial manner. It would also have been unfortunate if he had been a man who, however gifted in administrative abilities, had lacked the power of dealing with evidence in a clear and lucid manner. The new Air Minister, in fact, needs to be in the position of judge and jury towards the airship question. He should come into the court house ignorant of the facts, prepared to hear the evidence and to frame a sound verdict upon that evidence.

For such a task Lord Amulree appears to be peculiarly well qualified. He is a King's Counsel. He is a peer, and it was necessary that the new Air Minister should be a peer or should be given a peerage, for the statutory quota of Secretaries of State which may be in the House of Commons is already there. He is a Scot who has worked his way up to his present position by sheer industry and ability. That is a type which has given the Empire very many of its most useful men. His greatest work hitherto has been in industrial arbitration and conciliation. He was president of the Industrial Court from 1919 to 1926, and his services there were of immense importance. He was, up to the moment of his new appointment, Chairman of the Royal Commission on the Licensing Laws. That he should have been asked to relinquish that position while such an important enquiry was still in progress, shows that the choice before Mr. Macdonald was not large, and that the Prime Minister realised the great importance of finding the best possible man to take charge of the Air Ministry while the airship case is being argued. In difficult circumstances we think that Mr. Macdonald has made a very judicious selection.

In one respect we do not envy the new Air Minister the task before him. He has to hear and weigh evidence on the airship question. Those who would have been the leading counsel for airships are lying in the great grave at Cardington. We know of none who can plead the airship case so convincingly and with such authority as could Wing-Commander Colmore and Major Scott. But it may be that their place will, in a way, be taken by Dr. Eckener, who has, we understand, offered to help the enquiry in every way that he can, and who must feel desirous that Great Britain should not abandon her airship effort. But the new Air Minister will also have to formulate an opinion on whether the prospects of the large flying boats serving the Empire's needs are sufficiently good to make further airship experiment a too expensive luxury; or, intermediately, whether airship efforts should be continued with a sole view to the Atlantic crossing. The former question is mainly a technical one, and Lord Amulree cannot be well equipped to answer it. The latter does not call for deep technical knowledge, and if the matter should be narrowed down to that limit, then it becomes a matter for consultation between the Governments of Great Britain and Canada.

But we must not forget, and we are sure that Lord Amulree will not forget, the chances of airships being used for naval patrol over the ocean trade routes of the Empire. All these points need to be considered, provided that the report of the experts does not condemn the airship as such for all purposes. We shall await the report of the commission with the utmost interest.

❖ ❖ ❖

In this issue of FLIGHT we describe the new four-engined flying boat of which a number are being built by Short Brothers for Imperial Airways, Ltd., and which will, when completed, be put on the Mediterranean section of the London-India and London-South Africa air routes. The new machines will, although retaining their "family likeness" to the "Calcuttas," exhibit several interesting features not hitherto seen on British commercial flying boats. For example, stainless steel for the planking of the under-water part of the boat hull has been used on service flying boats, but not before on a commercial machine. The effect which this innovation will have upon the future of flying-boat operation may well be very great indeed. The all-metal flying-boat hull, when first introduced, marked a very great step forward, not only because it made it possible to effect a certain saving in weight as compared with the wooden hull, but even more because it avoided the water soakage which was inevitable with wood construction. The use of stainless steel may well have quite as far-reaching effects in that it will, if found entirely suitable, avoid the risk of corrosion, which is present to a greater or less degree with aluminium-alloy hulls. Stainless steel should prolong the life of a hull almost indefinitely, and thus the extra cost of this material may be well worth while in reducing depreciation.

Another unusual feature of the new Short flying boats will be the engine arrangement, in which the four Bristol "Jupiters" will be placed in line abreast. This arrangement has never been tried in a British commercial aircraft, and it will be interesting to see how it works out under actual operational conditions. The only uncertainty appears to be the effect of one of the outer engines cutting out. The yawing couple set up would be not inconsiderable, and a good deal of ruddering will be required to offset it, which will cause a certain amount of extra drag, thereby calling for slightly more power from the remaining engines. The power loading is, however, such that there is no reason to doubt that the machine will be able to continue its flight on the remaining three engines without calling upon them to give their full power.

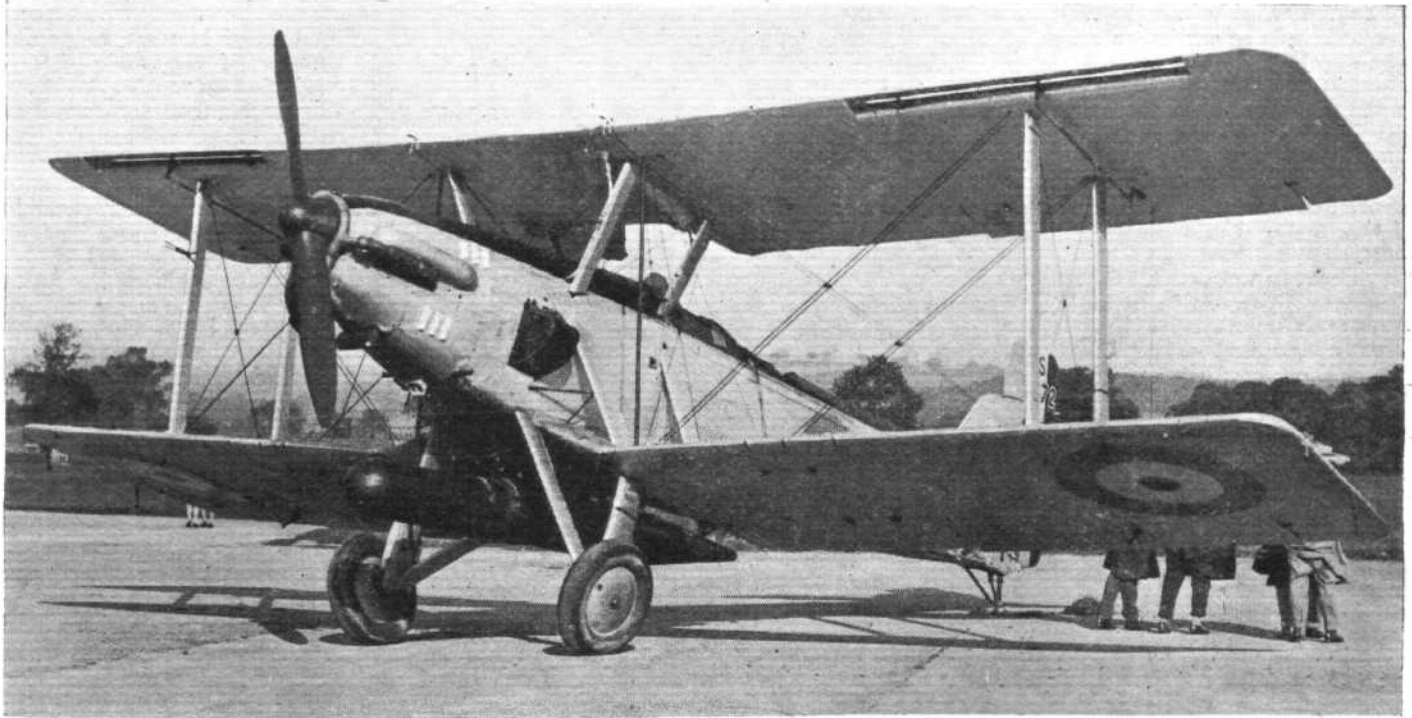
In the new Handley-Page machines, of which the first is now practically ready and likely to be flight-tested in the very near future, the arrangement of the four "Jupiter" engines is quite different. Two of the engines are placed, close together, in the upper wing, and the other two farther outboard on the lower wing. This arrangement gives a smaller yawing couple when one engine is out of action, but the high thrust line of the top engines will introduce an effect which is partly yaw and partly pitch. The Handley Page landplane and the Short flying boat are totally dissimilar machines, but the comparison between their engine arrangements should be interesting.



# BLACKBURN "RIPON III"

For a number of years the Blackburn company has made a specialised study of the requirements to be met in the design of torpedo-carrying aircraft. These photographs show the latest type to be produced, the "Ripon III," which is of all-metal construction and fitted with a Napier engine. Note that the ailerons are inter-connected with Handley Page leading-edge slots.

(FLIGHT Photos.)



# 4-ENGINE SHORT FLYING BOAT

## Bristol "Jupiter" Engines

GENERALLY speaking the design of the 4-engined flying boat which Short Brothers have designed and are now building for operation by Imperial Airways on the Mediterranean section of the Empire air routes is similar to the famous 3-engined "Calcutta" which has been in use for a period of years. Such design modifications as have been made are of a minor character only, and are the result of the experience gained with the older type. Apart from the fact that the new machines will be fitted with four instead of three "Jupiter" engines, the new boats differ chiefly in that the whole of the planing bottom, up to a little above the waterline, will be planked with stainless steel. No matter how the design of a flying boat hull is simplified, it is impossible entirely to avoid awkward corners in out-of-the-way places in the hull, and externally the inspection of the underwater portion necessitates beaching of the boat. Moreover, the flying boat of the future must be capable of being moored out for very long periods, and in fact should never be hauled up except when a thorough overhaul is to be carried out. The effect which the use of stainless steel for the planking of the underwater portion of the hull will have on the operational economy of the new boats cannot but be very great, and the introduction of this material into a commercial flying boat is to be very heartily welcomed. Of its success there can be little doubt. Stainless steel has already been used on certain portions of service types of flying boats, and any difficulties there may have been in the handling and application of the material will have been overcome by now. At the present time stainless steel is somewhat costly, it is true, but the life of a flying boat hull should be so greatly increased by its use that the extra cost is probably well worth while. And in any case, the more extensive use of stainless steel will undoubtedly in time lead to a considerable reduction in price.

If one examines the main data given in the table on this page it is found that the new 4-engined flying boats will (according to present estimates, which may be slightly modified when the first machine is completed) have a gross weight of 30,310 lb. and a tare weight of 17,900 lb., giving a ratio of gross to tare weight of 1.693. In other words, the disposable load is 69 per cent. of the tare weight of the machine, a figure which must be regarded as good for a flying boat with a gross weight of 13½ tons, especially as it is achieved with wing loadings and power loadings which must be regarded as very moderate. And it is estimated that with these loadings the machine will cruise at 100 m.p.h. with the engines running at 90 per cent. of their normal full power revolutions. The tare weight given in the table includes cabin equipment, but does not include such items as wireless equipment, electrical equipment, certain instruments, and marine equipment, fire extinguishers, domestic water supply, etc., nor, of course the weight of the crew and their gear. All these items amount to 1,560 lb., and as the machine is incomplete without them, the figure of 1,560 lb. should either be added to the tare weight or subtracted from the variable load. If that is done it is found that the variable load

amounts to 10,850 lb., or 4.9 lb./h.p., based on normal full power.

Obviously the variable load may be divided in any proportion desired between fuel and pay load, according to the range it is necessary to have. The tankage provided will allow for 720 gallons of petrol and 54 gallons of oil, which is sufficient for 8 hours' duration, or a range in still air of about 800 miles at a cruising speed of 100 m.p.h. The weight of fuel and oil (full tanks) would be 6,160 lb., and would still leave a pay load of 4,690 lb. Normally it is intended that the tanks should not be quite full, but should hold sufficient for 5 hours' flight, or a fuel and oil weight of 3,860 lb. This would leave a pay load of 6,990 lb., or 3.15 lb./h.p. based on normal full power.

It is intended that this pay load should be divided equally between mails and passengers. Actually 3,550 lb. for mails, and 3,440 lb. for passengers. The latter figure corresponds to 16 passengers at 215 lb. each, a weight which will leave each passenger (except the unusually heavy) an ample allowance for luggage.

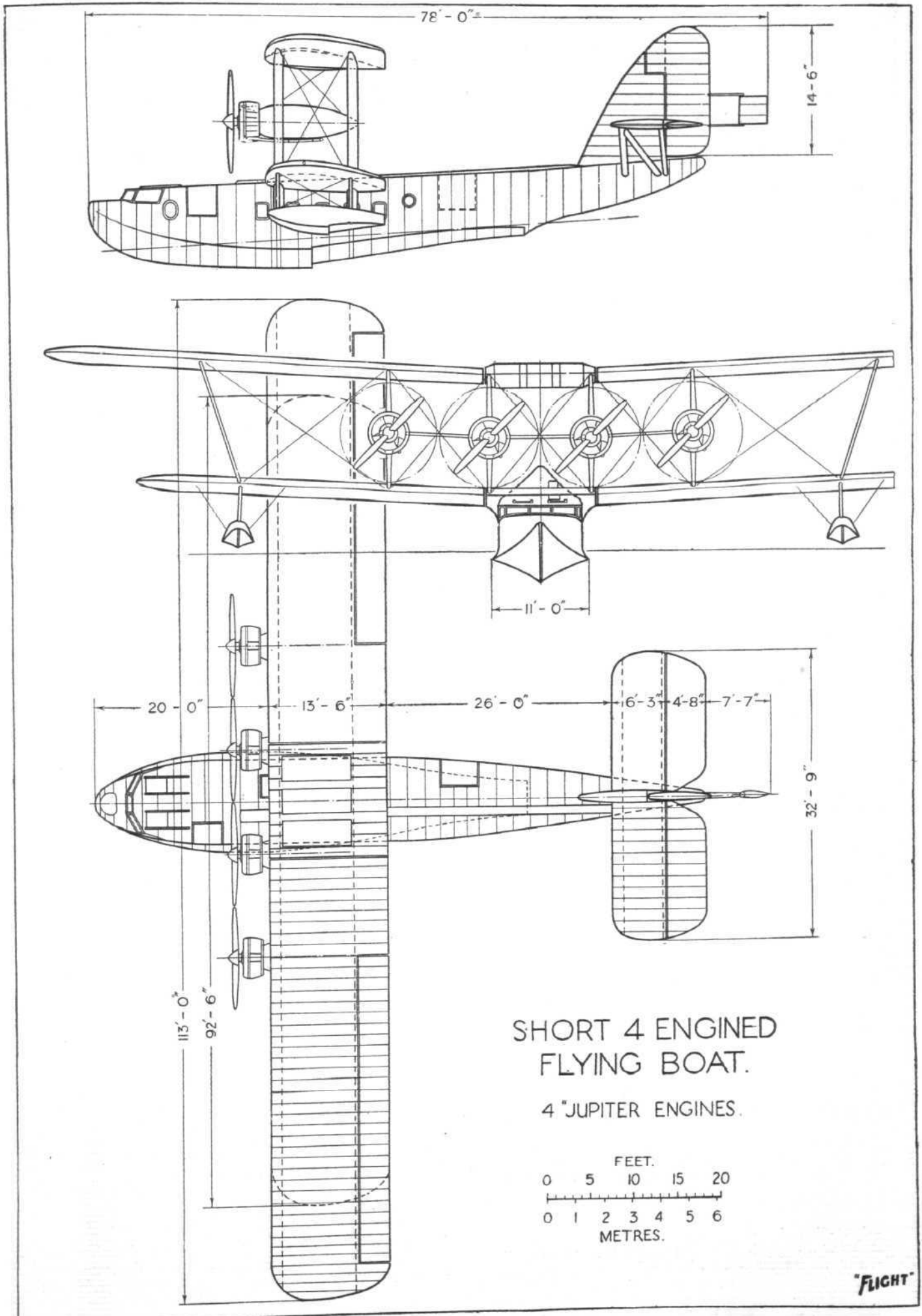
It is of interest to point out that if the whole of the variable load were in the form of petrol and oil, the duration would be something like 14 hours. This figure does not take into account the weight of the extra tanks that would have to be fitted, but on the other hand, if the total available load were used for fuel, there would be no need for passenger cabin equipment, the weight of which could be used for tanks.

In order to facilitate an estimate of the relationship between pay load and duration, or range, of the 4-engined Short flying boat we have prepared the graph published on p. 1132. It is not claimed that this chart will give very great accuracy, since in the calculations on which it is based no account has been taken, for long ranges, of the effect of the gradual lightening due to the fuel being consumed. But it is thought that the graph will assist in making very readily an approximate estimate of the pay load on route stages of various lengths.

As already mentioned, the main difference in general design between the "Calcutta" and the new flying boats will be the use of four instead of three engines. This is probably a stipulation made by Imperial Airways, Ltd., in order further to reduce the likelihood of forced landings. The new four-engined flying boats have a gross weight considerably greater than that of the "Calcutta," but the power loading will be almost exactly the same. Therefore the increase in power loading when one engine is out of action will be smaller in the new boats than in the "Calcutta." More explicitly, when one engine stops in the "Calcutta" the power loading is increased to  $3/2 = 1.5$  times its previous value. In the new boats the increase will, of course, be in the ratio  $4/3$ , or 1.33 times the original figure. Thus in case of failure of one engine, the remaining three will not have to be called upon to give as much extra power as in the "Calcutta," and the likelihood of another engine giving trouble will, therefore, presumably be correspondingly reduced. In fact, the power loading of the remaining three engines seems to be such that the machine will probably be able to continue its

### FOUR-ENGINE SHORT FLYING BOAT Bristol "Jupiter" Engines

Dimensions			
	ft.	in.	metres.
Length o.a. .. ..	78	0	23.8
Wing span (upper) ..	113	0	34.4
Wing span (lower) ..	92	6	28.2
Weights			
	lb.		kg.
Tare weight (including cabin equipment) ..	17,900		8,125
Gross weight .. ..	30,310		13,755
Disposable load .. ..	12,410		5,630
made up as follows:			
Crew of three and kit ..	645		293
Sixteen passengers and luggage .. ..	3,440		1,563
Mails .. ..	3,550		1,613
W/T equipment .. ..	340		154
Electrical equipment ..	90		41
Instruments, marine equipment, etc. .. ..	485		220
Petrol (450 galls.) .. ..	3,510		1,595
Oil (35 galls.) .. ..	350		159
Estimated Performance			
Maximum speed at 5,000 ft. .. ..	132 m.p.h.		212.5 km./h.
Cruising speed at 5,000 ft. .. ..	100 m.p.h.		161 km./h.
Minimum flying speed .. ..	60 m.p.h.		96.5 km./h.
Initial rate of climb .. ..	760 ft./min.		3.86 m./sec.
Service ceiling .. ..	19,000 ft.		5,800 m.
Rate of climb at 5,000 ft. .. ..	800 ft./min.		4.06 m./sec.
Time to take-off (full load) in a calm .. ..	18 seconds.		
Time to 10,000 ft. (3,050 metres) .. ..	14 minutes.		
Endurance (normal petrol) .. ..	5 hours.		
Endurance (maximum petrol) .. ..	8 hours.		



**FOR THE MEDITERRANEAN:** Designed to carry 16 passengers and 1,400 lb. of Mails, a number of these machines will be put into service by Imperial Airways, Limited.



flight at a slightly reduced cruising speed, without speeding up the engines.

It will probably come as something of a surprise to many to find that, after achieving an outstanding success with their four-engined "Singapore II," Short Brothers have chosen the 4 in line arrangement of the engines in the new commercial flying boats. How far this arrangement is the choice of Short's designers, and how far they have been influenced by the requirements of the future operators of the machines, we have no means of knowing. The decision cannot have been an easy one. On the one hand there is the probability of reduced drag with the engines arranged in tandem pairs, and the smaller yawing moment of the engines placed closer in towards the centre. On the other there is the fact that the wing stresses are reduced by placing the engines in line abreast, while the difficulty of cooling the rear engines does not arise, nor the power loss likely to be encountered when one of the front engines stops and the "overpitched" propeller of the rear engine works in air of less relative velocity. In the "Singapore II" Rolls-Royce water cooled engines are used, and the question of cooling the rear engines presents no particular difficulty. But with air-cooled engines the "pusher" has not hitherto been the subject of very much experimentation in this country. This may actually have been the deciding factor in settling the engine arrangement on the new four-engined Short flying boats.

The actual engine mountings in the new machines are evidently an adaptation of those used on the "Singapore II," the changes being those necessitated by the fact that the engines are radials, and placed singly instead of in tandem pairs. On the "Singapore II" this type of engine support was found to give excellent results, being light, strong and simple. In the new machine the engine nacelles are carefully streamlined and will doubtless assist materially in reducing the drag to a value which may be no greater than would have been the drag of engines in tandem, for which streamlining could not be carried out.

In actual dimensions the new four-engined flying boats will be considerably larger than the "Calcuttas." For example, the span of the lower wing is approximately the same as the span of the upper wing of the "Calcutta," while the upper wing is of 113 ft. span as against 93 ft. of the "Calcutta." The boat hull, although generally similar in its lines, will also be materially larger, and the extra width of cabin will be utilised by placing the seats in lines of four abreast across the cabin.

Structurally the new machines will, generally speaking, be similar to the "Calcuttas," i.e., the wings will be of the now familiar Short type of construction, with corrugated Duralumin strip box spars and tubular Duralumin ribs, and the hull will show the typical Short features of the transverse frames forming the main members, with the skin or planking doing its share in bearing stresses, while the fore-and-aft stringers are used to stiffen the planking in compression, but are interrupted at the frames. The introduction of stain-

less steel for planking of the planing bottom is an innovation, and has already been mentioned.

### Accommodation

The layout of the accommodation in the hull is so arranged that in the extreme bows there is a compartment containing the mooring equipment, with a hatch in the deck closed by a hinged cover. Aft of the mooring compartment is the large cockpit for the pilots, whose seats are placed side by side, but with a space between to give access to the mooring compartment. Dual controls are provided, and the machine can be flown from either seat. Behind the cockpit is the wireless cabin, which contains, in addition to the wireless equipment, a chart table and other accommodation for the wireless operator-navigator. Aft of his cabin, on the starboard side, is the large mail compartment, which will hold some 3,500 lb. of mails. Behind that is the passenger cabin, with seating accommodation for 16 passengers, the seats being arranged in four rows of four seats each. The cabin has a length of 14 ft., a width of 8 ft. 9 in., and a height from floor to ceiling of 6 ft. 6 in. Aft of the cabin is a lavatory on the starboard side and the steward's compartment, with complete cooking facilities, on the port side. And finally a large luggage compartment is situated aft of the lavatory, with a separate entrance hatch.

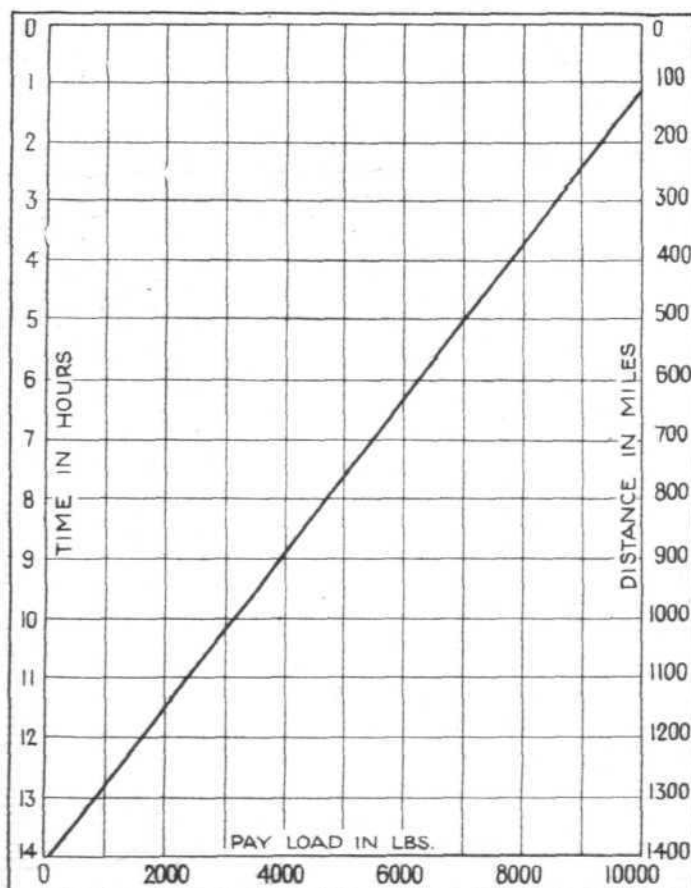
The four rows of seats are well spaced out fore and aft so that there is ample leg room. Each side has hinged to its backrest a table for the use of the passenger behind, and footrests are also provided, so that passengers should be able to make prolonged flights without fatigue.

The four engines fitted will be Bristol "Jupiters" of the XI. BM. type, i.e., moderately supercharged to 5,000 ft. in order to give maximum performance at that height. The engines are of the geared type, and should thus give good propeller efficiency.

They are mounted in nacelles of monocoque construction, a type which has been found to be very satisfactory and which possesses great torsional strength. The mounting of the engines has been so designed that they can readily be removed from the aircraft by means of slinging gear carried on board. This will permit of changing engines while the machine is moored on the water. Hand turning gear for starting is provided in each engine nacelle, and a gas starter is installed in one of the nacelles and coupled up to all the engines.

Large petrol tanks are carried in the top centre-section, the total capacity (720 gallons) being sufficient for 8 hours' flight at cruising speed. Normally, however, only 450 gallons will be carried. This is sufficient for 5 hours' cruising. Petrol is supplied to the engines by direct gravity feed, and the piping is so arranged that any or all engines can be fed from either or all tanks. Connections are fitted to all tanks to enable them to be filled from a central supply, and a refuelling pump is fitted in one of the nacelles for this purpose.

The crew will normally consist of three: chief pilot, second pilot (who will also act as wireless operator and navigator) and steward.



### "En-Tout-Cas."

MOST of our readers are familiar with the name "En-Tout-Cas" in connection with tennis courts, golf courses, cricket pitches, etc., in non-aviation "walks" of life. We now learn that the En-Tout-Cas Co. (Syston), Ltd., of Syston, near Leicester, have entered the field of aviation, as regards the construction of aerodromes, where the "En-Tout-Cas" system applies. For instance, they obtained the contract for

the building of all the hangars (large enough to hold 11 Gipsy Moths), also the building of the offices, stores, making of the approach roads, turfing, planting, fencing, etc., at the Ratcliffe Aerodrome opened a few weeks ago, and carried out the whole of the work (with the exception of the making of the aerodrome) in eight weeks. We hope to have something more to say regarding "En-Tout-Cas" and aviation in a future issue of FLIGHT.



# PRIVATE FLYING AND CLUB NEWS



## THE LONDON AEROPLANE CLUB.

—The flying time during the past three months shows a steady increase over that of last year, and 21 members have qualified for their "A" licences.

The question of providing more commodious premises at Stag Lane has been exercising the minds of the Committee for some time, and it is hoped shortly to complete these negotiations so that the new quarters will be ready for occupation before Christmas. This will enable the Club to provide accommodation for a limited number of privately-owned aircraft.

The London Aeroplane Club is holding a raffle for three aeroplanes:—

**1st Prize.**—Entirely new D.H. Puss Moth, 1931 model, fully equipped with all instruments, and fitted with air brakes, air wheels and wheel brakes.

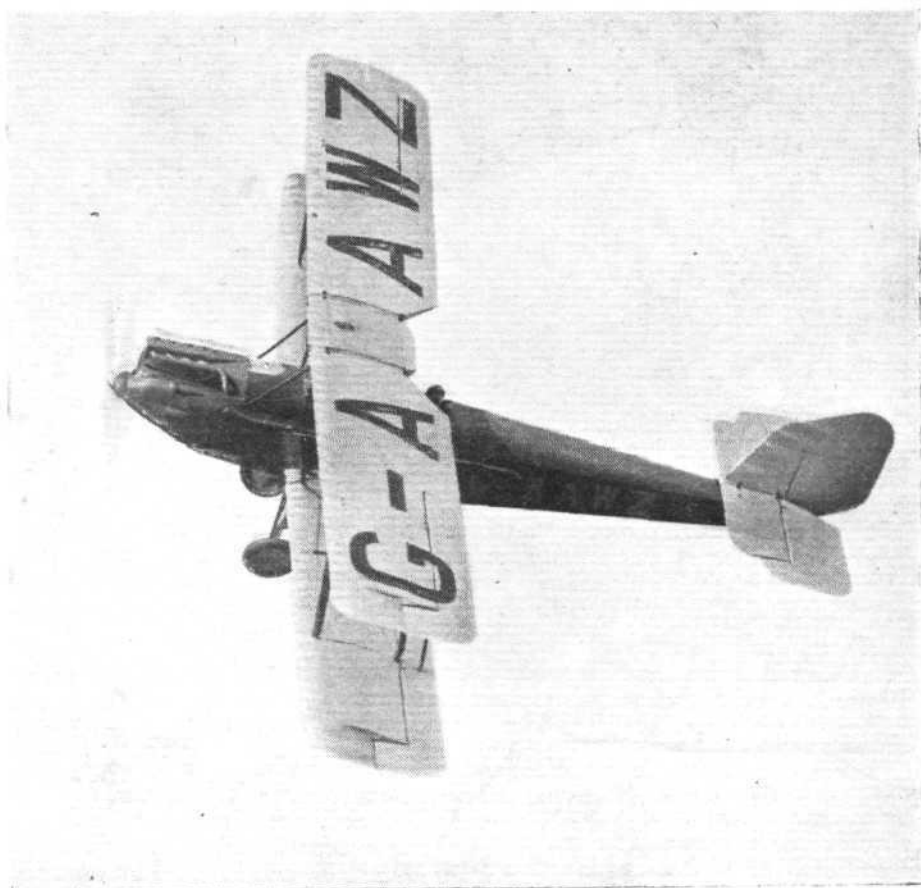
**2nd Prize.**—Second-hand D.H. Moth Cirrus Mark II, fitted with slots, compass, telephones, etc., dual control. Current certificate of airworthiness.

**3rd Prize.**—Second-hand D.H. Moth Cirrus, Mark II, fitted with slots, compass, telephones, etc. Dual control. Current certificate of airworthiness.

Each aircraft will be painted in any colours desired by the winner. Tickets 10s. each.

In order to meet the requirements of the various clubs in the Dominions, a certain number of tickets will be reserved for them until December 31, 1930. Applications for tickets should be made to London Aeroplane Club, 3, Clifford Street, London, W.1, or at Stag Lane Aerodrome, Edgware.

**CINQUE PORTS Flying Club.**—The total flying time for the week ending October 11, was 33 hrs. 15 mins., made as follows:—Dual instruction: (13 members) 11 hours. Advanced dual: (Mr. Fotheringham-Parker) 30 mins. Soloists under instruction: (4 members) 7 hrs. 30 mins. "A" pilots: (9 members) 10 hours 45 mins. Tests and special journeys: 3 hrs. 30 mins.



A flying picture of the new Spartan "Arrow," which possesses several distinctive features—of which more anon. (FLIGHT Photo.)

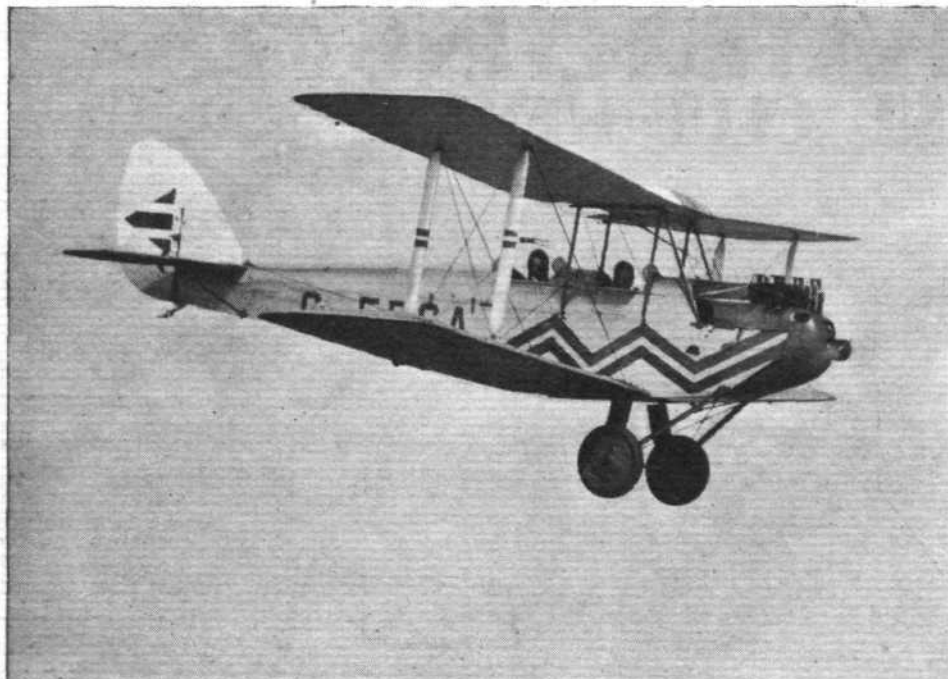
Gales of wind stopped flying on Monday and Wednesday of this week, so that the time of 33 hours is exceedingly good considering the short daylight.

On Thursday, the 9th instant, Mr. R. T. Reynolds, of Tonbridge, was sent solo, and on the same day, Mr. C. Cornwell, of Hastings, passed all his tests for "A" licence.



The Pander biplane, fitted with a D.H. 'Gipsy I' engine, on which Mr. Van Tijen is to attempt a flight to the Dutch East Indies. It has an all-steel body, metal airscrew, and Bendix wheels and brakes.





Mr. R. H. Wynne, Ground Engineer of the Cinque Ports Club, flying a club Moth (Cirrus II), photographed by a member of the Committee from another club machine. The Club markings on the fuselage are Royal blue, white and orange.

Mr. Cornwell is the first member the club has had from Hastings, and has put up an excellent performance, and we hope that his example will result in many more Hastings people joining the club and taking up flying.

A ballot was taken for the club pilot to represent the club officially at the big Air Pageant, which is being organised by the Air Ministry, for Saturday, October 25, as a demonstration to the members of the Imperial Conference of the capabilities of modern British aircraft. Capt. H. A. Shadforth, of Rye, was the winner, and will fly the club machine to Croydon. We hope that many of our private owners will make a special effort to accompany him on this day, so that Lympne may be represented by an imposing fleet of aircraft. The club itself can only spare the one machine.

On Sunday, 12th, as the Ashwell-Cooke Competition had been abandoned, an impromptu affair was organised. Mr. Calvert was appointed Judge, and the competitors could receive a possible ten marks for performing accurately, ten different evolutions, including take off, left and right-hand vertical turns, gliding turns, approach, landing, etc. The result was: winner, our ground engineer, Mr. R. H. Wynne, with 97 marks out of 100; second, Mr. K. H. F. Waller, with 94 marks; and third, Mr. R. Dallas Brett, who misjudged his approach and "rumbled" over the hedge, 69 marks. There was no prize, but the loser paid for subsequent refreshment. This competition was good fun, and it is hoped to get up some more from time to time.

**THE HAMPSHIRE** Aeroplane Club.—With 256 hr. having been flown during the month of September, the club achieved, in nine months, the long outstanding ambition to fly 2,000 hr. in a year, the actual figures being 2,007.

Five members qualified for the "A" licence and a further five passed the flying tests.

It is interesting to note that a father and daughter, Lieut.-Col. L. G. Bird and Miss J. L. Bird, who were on two months' leave from Hong Kong, both qualified on the same day.

New members are still coming along and nine joined during the month.

The landing competition for the Club trophy, on September 28, was won by the Chairman, Capt. A. R. T. Kirby.

**LEICESTERSHIRE** Aero Club Appointments.—Mr. C. Howard Bolton, who has been a member of the Leicestershire Aero Club practically since its inception, has been appointed chairman in succession to Mr. Roy Winn.

Mr. Winn becomes chairman of the Flying Committee in place of Mr. C. Hirst, who has resigned the chairmanship owing to the pressure of business. Mr. N. W. R. Mawle is now chairman of the Finance Committee.

**INDIAN** Flying Club news is sometimes late in reaching this country, but we think the following report, from the *Statesman*, of Calcutta, of September 18, concerning the flying club scheme for United Provinces, may be of interest.

"The idea of inaugurating a flying club in Allahabad was first mooted three years ago, and thanks to the activity of public-spirited citizens the scheme is likely to progress rapidly, provided sufficient support is given to the venture.

"The scheme, which has been drawn up by an expert in civil aviation, provides for the formation of a group of clubs in the more important cities of the United Provinces with headquarters at Allahabad, though in actual working each club will be a separate entity run by its own committee, providing facilities for flying and training and amusements for non-flying members.

"At present the organization responsible for drawing up the proposal is in possession of two aeroplanes, spare engines, and necessary spare parts, and this will enable an immediate start being made with the scheme in Allahabad. All that remains to be done is to secure the necessary permission for the use of Bamrauli Aerodrome, the lease or purchase of a plot of ground sufficiently large to enable the erection of a club house, possibly with tennis courts and a golf course attached, and then settle down to securing membership that will ensure the future of the club, irrespective of such transient sources of income as Government subsidies and the like.

"The same procedure is to be applied to other cities where clubs are to be started—Lucknow, Cawnpore, and Benares."



"This Desirable Residence"—will probably be used by the Surrey Aero Club for their Club House at Gatwick.





# GLIDING

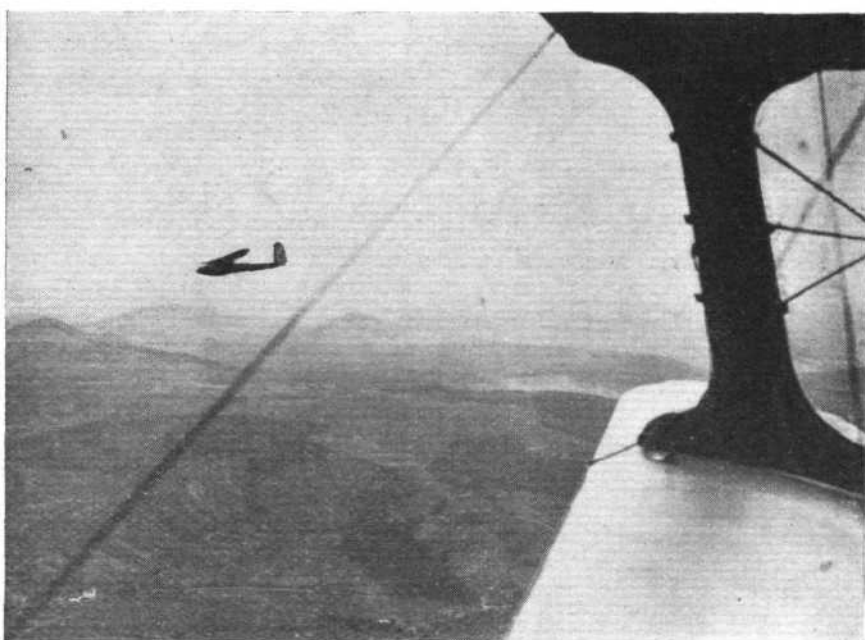


**SOUTH ESSEX Aero Club.**—What can be truthfully described as a successful meeting was held on Sunday by the South Essex Aero Club at their new ground near Abridge. Thanks to the spirited support of Mr. J. Chambers, on whose ground the club now operates, the members were able to exercise in full their flying abilities without restriction. Starting early on Sunday morning, gliding was carried on almost without a break until dusk.

Those able to stay the day were able to take the machine up on several occasions, and although some members attained a fair height they all concentrated on beating one another in the length of their flights. The majority of members have now become accustomed to being precipitated into the air, and with a little more practice the club will have a number of capable glider pilots. It is intended to carry on gliding as far as possible throughout the winter with mid-week meetings for those who find a week-day more convenient.

In order to ensure an all-the-week interest, arrangements are well in hand for the establishment of a workshop where members will be able to demonstrate their ground-skill and indulge in glider construction to their hearts' content. The club intends to justify the inclusion of such notable names as Sir A. V. Roe and Sir Alan Cobham, K.B.E., A.F.C., who are vice-presidents to the club, by arranging lectures and meetings with the object of fostering the cause of aviation in Essex. Those who have not yet participated in what is the finest of all sports, a sport without parallel, and which contains a thrill without danger, should not hesitate to write to the secretary, South Essex Aero Club, 19, the Pavement, Chadwell Heath, for further particulars as to membership, etc.

**THE SAIL-PLANE Club of T.M.A.C.**—Sunday was a day of mingled pleasure and disappointment at Smallhole. It was a pleasure to welcome the Surrey Club as guests for the day, and no less a pleasure to see some of them make good use of the Sail-Plane Club's wonderful ground, whereon they were able to carry out advanced training exercises for the Itford Contest next Saturday. Fortunately, the wind was almost ideal in direction, and full use was made of the big horse-shoe basin. Unfortunately for the Sail-Plane Club, after three flights had been made on their instructional machine, one of those mishaps occurred which put the machine completely out of action for the day, though the pilot was unhurt. So the attempts of several other members to



The Darmstadt glider soaring over the Gersfelder Valley, as seen from an aeroplane.

"make 'A's' while the sun shone" were temporarily abandoned.

Three Surrey Club pilots made some pretty flights, and were unanimous in their praise of the Sail-Plane Club's location. Incidentally, "Surrey" should put up a good show at Itford, and we wish them luck. There will be no gliding at Smallhole next Sunday, as everyone will be at Itford.

Applications for membership should be made to the hon. secretary, E. G. Smettem, 2, Wine Office Court, Fleet Street, London, E.C.4.

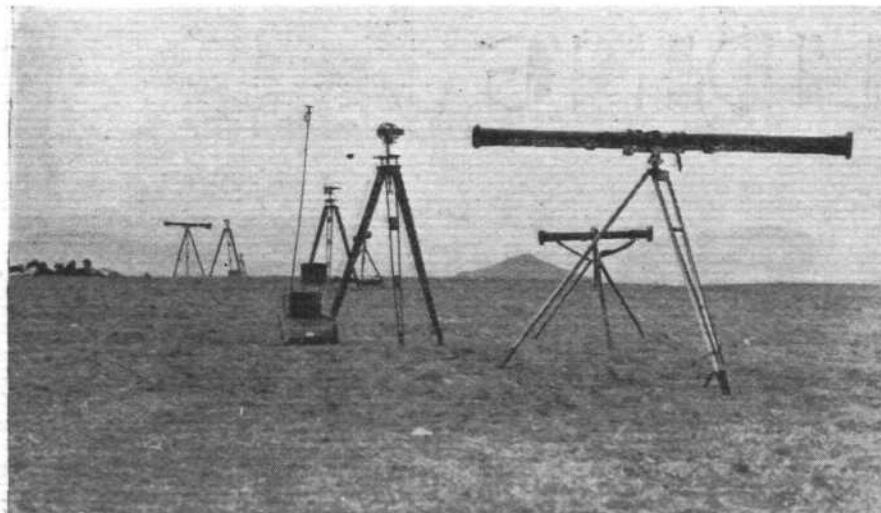
**NORTH STAFFS Gliding Club.**—Mr. Coles, the club's instructor, opened the proceedings at Wetley Common, on October 12, by several good glides from the top of the slope and, aided by a strong wind, all club records were broken. Mr. Northall took off twice from the same place with good results, and later, when the wind had abated, the less-experienced members made flights. At the end of the day the machine was damaged by a collision with a wall, but, thanks to Mr. Northall (the pilot) and the strong construction of the B.A.C. Primary Type Glider in use, the damage was not serious.

A few of the members of the club are attending the Kent Gliding Club's meeting next week-end. Further meetings will be held at Wetley Common on October 26, and each subsequent Sunday. The Hon. Sec. of this club is Mr. C. Teeton, 3, Havelock Place, Shelton, Stoke-on-Trent.

**GLIDING IN IRELAND.**—The Belfast Gliding and Aviation Club, which is the first Irish organisation to take up gliding, recently held a special general meeting to complete the details for a start of practical work. The number of members now enrolled is nearly two hundred, approximately half of these are flying members. Subscriptions have now been fixed at 10s. 6d. for non-flying members, and £1 1s. for flying members. It has been decided to abandon the idea of the purchase of a glider for this year, but members who have



"IN THE BALANCE": This picture shows a member of the Sailplane Club of T.M.A.C. carrying out a balancing feat on the club "sailplane," which is mounted on a pivot.



**The Lunch Hour!** The various instruments used in checking altitude, etc., of gliders at the Wasserkuppe left in idleness—for the time being.

studied the art in England are to construct a training machine during the winter months, and another, probably of the Reynard type, will be bought next year.

The general rules of the Club have now been approved, and the following officers elected:—President, Capt. R. L. Henderson; vice-president, Major R. Heyn, O.B.E.; chairman and captain, Mr. E. H. Blount; secretary, Mr. W. F. Boam; treasurer, Mr. E. E. Lee. During the next few weeks the Club is to be affiliated to the British Gliding Association, and arrangements made for a series of lectures to take place during the winter months.

**THE BRADFORD** Gliding Club.—The above Club had a flying start on Saturday last, October 11, when they were presented with their first Glider—a Dickson type, built, by Mr. H. Sutton and presented to the Club by Mr. W. R. Derwent, General Manager of The Bradford and District Newspaper Co., on behalf of *The Yorkshire Observer*.

Herr Magersuppe, the German expert, came over from Scarborough and very kindly consented to fly the machine on its maiden flight. He made two flights and after expressing his approval of the Glider, gave club members some very valuable instruction, afterwards giving a short demonstration on the Ilkley Club Zögling, which had been brought along voluntarily, by some members of the Ilkley and District Gliding Club, to assist at this event. Members of the Ilkley and Bradford Clubs then made alternate flights until darkness intervened. Altogether about 20 flights were made.

The Bradford Club held a flying meeting on Sunday last, but the meeting was closed after only four flights, owing to the gusty wind becoming dangerous for primary flight.

The club hope to continue flying throughout the winter, but owing to difficulties arising with the owners of the proposed flying field on Baildon Moor, may be without a definite ground. Until further notice flying will take place at Apperley Bridge, Saturdays, from 2 p.m. till dusk, and Sundays from 9.30 till dusk.

**GLIDING** in the I.O.W.—In order to stimulate public interest in gliding, the club has arranged to hold a series of informal meetings in various parts of the island, and the first of these was held on Sunday, October 12, at Somerton Aerodrome, West Cowes, permission to use which having been kindly given by the directors of Saunders-Roe, Ltd. A very large crowd was in attendance, the club's new

B.A.C.II was greatly admired, and everybody keenly interested. As these meetings consist of purely instructional work, no charge is made for spectators, the idea being simply to arouse interest and enrol new members.

Marked progress was observed in the members, some of whom made particularly good efforts. In between these instructional "hops," Capt. F. W. Merriam, the club instructor, took the machine up and demonstrated how it should be flown.

Rather early in the day, a member made a heavy landing and broke the rear starboard strut. The starboard wing was quickly dismantled, the broken strut spliced, and the wing reassembled within 30 min. This afforded a good opportunity of demonstrating the quick and simple manner in which this type of machine can be dismantled and erected.

Miss R. Merriam, the first lady member to receive instruction, put up quite a good show, and well deserved the applause of the spectators. It is apparent that Miss Merriam

has inherited her father's sense of feel and balance, whose ability of "gliding" box-kites is well known to old timers.

Instruction continued until 17.30 hrs., when another heavy landing caused the repaired strut to give out, and this, throwing double load on to the remaining starboard strut, caused it to break also. The slow manner in which the wing sagged down was pathetic! The necessary repairs are now well in hand, and next Sunday the machine will be tested out, fitted with all-metal struts. The addition of an aluminium bucket seat is also hoped to be an improvement.

**MISS LIPPENS**, daughter of the Belgian Air Minister, Sir Maurice Lippens, who is visiting the various gliding centres with her soaring machine, made a splendid half-hour flight from the soaring ground of the Channel Gliding Club at Fokestone on October 14. This flight is believed to constitute a world's record soaring flight for a woman. Her sporting tour of the country is helping forward the gliding movement here, which is controlled by the British Gliding Association.

**THE WILTSHIRE** Light Aeroplane and Glider Club.—

This recently formed club held a successful inaugural light 'plane and glider meeting on October 11 and 13 at Yatesbury, on the Downs between Calne and Marlborough. Weather conditions were ideal, and several practice flights were accomplished on the club glider. Mr. H. J. Penrose, of the Westland Aircraft Co., of Yeovil, made the longest flight, remaining aloft for 54½ seconds, and covering a distance of just over one mile.

Several others also made flights, of nearly the same duration and distance, and all took off easily, and made excellent landings. During the proceedings some 16 light aeroplanes mingled—more or less—with the gliders. These machines were piloted, amongst others, by Capt. Wymour, Lieut. P. R. Bentley, Mr. Powis and Mr. T. Rose.

Flying was continued on Monday, and some further successful glides were put up. Perhaps the best performance of the day was accomplished by Mr. Lowe Wyld, who remained up for just over 65 seconds in the Eastbourne Club's glider; he covered a distance of approximately 1¼ miles. Some fast gliding was also achieved by Mr. Beardmore and Lieut. Bentley, the former, in the London Club's machine, covering 1¼ miles in 64 seconds, and the latter, in the Wiltshire glider, covering just over the mile in 65 seconds.

## B.G.A. DINNER TO HERR KRONFELD

**ON** October 14 the British Gliding Association gave a dinner at the Trocadero to Herr Kronfeld, the famous Austrian gliding and soaring pilot. Mr. Handley Page was in the chair, and in proposing the toast of the guest referred to the great work done by Herr Kronfeld. He had shown what could be achieved by improving the machine. Hitherto, the procedure in commercial aviation had been to crowd on more power. He was glad to see so many people take an interest in a movement which aimed at improving the aircraft itself. Herr Kronfeld, replying to the toast, said too much had been made of his own share in the work. What mattered was that he had been able to help in getting people interested in the new movement, and he thought that British pilots would soon be able to make soaring flights of 100, 200 or even perhaps 300 miles.

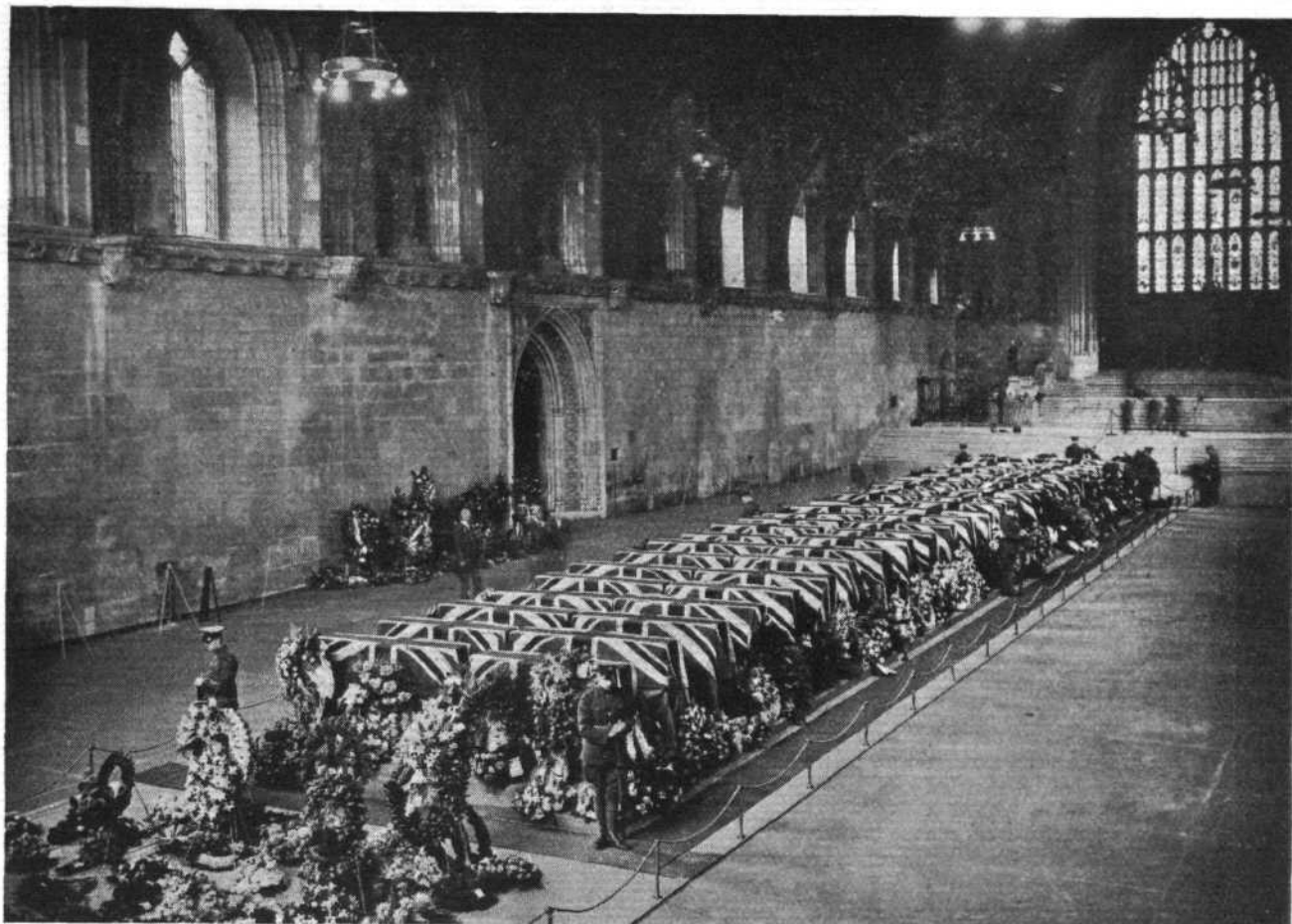
Squadron-Leader T. England spoke of the work of the B.G.A., and pointed out that the membership now exceeded 150, while 32 clubs were affiliated.

Mr. Gordon England said that cheap aeroplanes could be produced but the mission of the gliding enthusiasts was to get people so interested that they would buy those cheap aeroplanes.

Mr. Alan Goodfellow recorded that he found gliding useful in reducing avoirdupois, and referred to the fact that gliding was essentially *team work*. He delivered a short poem in which witty use was made of the "Poppenhausen Doppelsitzer."

Mr. Geoffrey Woolfe replied on behalf of the visitors, or as he preferred to call them the friends of the gliding movement.





Lying-in-State in Westminster Hall. ("Times" Photo.)

## R 101

### Funeral of Victims

**T**HE coffins containing the bodies of 47 of the victims of R 101 were brought from Beauvais on Tuesday, October 7. At the ceremonies at Beauvais, the King and Queen were represented by Lord Tyrrell. M. Tardieu attended in person. France observed the day as one of national mourning. A special train conveyed the bodies to Boulogne, and was saluted at the stations which it passed en route.

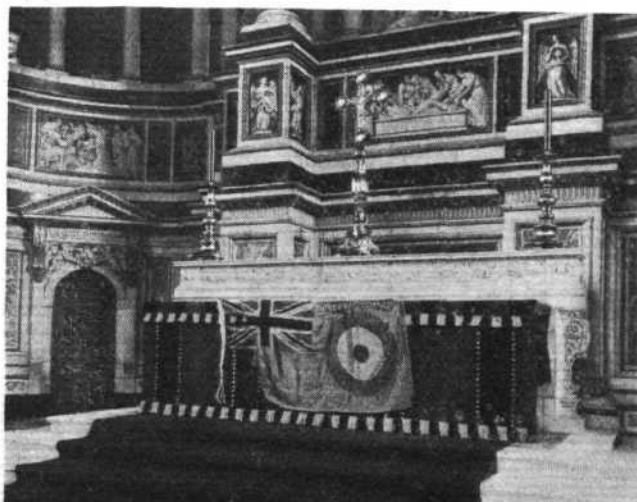
Two destroyers, H.M.S. *Tempest* and *Tribune*, awaited the coffins at Boulogne, but the *Tribune* damaged her propeller and the *Tempest* brought all the bodies across to Dover. From there they were taken by train to Victoria, which was reached at a very early hour on Wednesday morning. A large crowd, including the Prime Minister, was waiting at Victoria to see the train arrive. R.A.F. tenders then conveyed the bodies to the Westminster Mortuary in Horseferry Road, which was suitably lighted and decorated.

On Wednesday, Rigger S. Church died from his injuries in the hospital at Beauvais, and his body was brought over and laid beside the rest. A formal inquest was held by the Westminster Coroner in order that a burial order might be issued.

On Friday, the 48 coffins, each covered by a Union Jack, lay in state in Westminster Hall from 8 a.m. till after

midnight. Enormous crowds filed through the hall all day to pay their tribute to the dead. In the afternoon the queue awaiting entry to the hall was half a mile long. The ceremony had been timed to end at 10 p.m., but at that hour so many people were still waiting that the time was postponed until 12.30 a.m.

On the same day a memorial service was held at St. Paul's, commencing at noon. The King was represented by the Prince of Wales. The Lord Mayor attended in official robes. M. Laurent Eynac, French Air Minister; General Italo Balbo, Italian Air Minister; and M. Lippens, Belgian Minister of Communications, were among those present. Mr. Ramsay MacDonald, Mr. Baldwin, the members of the Cabinet, three of the survivors (Messrs. Leech, Bell, and Binks), the relatives of the dead, a detachment of the Royal Air Force, foreign Ambassadors and representatives, and many other distinguished people, besides as many of the public as could be accommodated, were in the Cathedral. The pennant of the airship, which had not been reached by the flames, was displayed on the altar cloth. The service was conducted by the Archbishop of Canterbury and the Bishop of London. The central band of the Royal Air Force played Mendelssohn's Dead March and other solemn pieces



Pennant of R 101 on the Altar of St. Paul's. ("Times" Photo.)

before the opening of the service. After the benediction, pronounced by the Archbishop, the organ played the Dead March in "Saul," and then R.A.F. trumpeters sounded the "Last Post."

At the same hour a requiem mass was held in Westminster Cathedral for the four Roman Catholics who had perished in R 101. The mass was said by Father Harry Rope, brother of Sqdn.-Ldr. F. M. Rope. Cardinal Bourne, Archbishop of Westminster, was present.

On Saturday, the coffins were taken from Westminster Hall and conveyed to Cardington where they were all buried in a common grave. The funeral procession through London to Euston station was the most impressive ceremony of the sort which has been seen in London for many years. Enormous crowds lined the route for the whole distance. Starting from Westminster Hall at 10 a.m., the cortege followed the route: Westminster, Whitehall, Trafalgar Square, Strand, Aldwych West, Kingsway, Southampton Row, Russell Square, Woburn Place, Tavistock Square, Upper Woburn Place, Euston Road, Euston Station, arriving at the station at noon. The procession was headed by mounted police. Next marched a detachment of the Royal Air Force with arms reversed. It was followed by the Royal wreaths and the wreath of the Air Council. Then came the band of the Royal Air Force, and then 24 army waggons each bearing a coffin covered with the Union Jack. There followed a detachment of the Grenadier Guards, the Army Council wreath, the band of the Welsh Guards, and then 24 more waggons bearing the remaining coffins. There followed cars with the Prime Minister, members of the Cabinet, and representatives of the Dominions and India. Dr. Eckener and Commander Sir Dennistoun Burney walked in the same group. Many of the relatives also walked in the procession. The spare watch of R 101 marched behind their dead comrades, followed by the crew of R 100. Major Scott, Flying Officer Steff, Sqdn.-Ldr. Johnston, Mr. Giblett, and six others of the dead had been on R 100 on her Canadian flight. The group of foreign Air Attachés showed how all nations joined in Britain's mourning. The Air Council, the Army Council, and the Board of Admiralty were there. A detachment of the Royal Navy marched behind. Finally, vans brought the 3,000 wreaths which had been sent in sympathy.

At Euston the coffins were lifted into vans draped inside with purple. For the fifty miles to Bedford the railway was lined with people anxious to pay their last tribute. Crowds waited at every station to see the train pass by, ex-service men wearing their medals and standing at attention. In the cemetery at Cardington, hard by the airship station, one common grave had been dug for all and lined with flowers. There the 48 coffins were laid side by side. Anglican, Presbyterian, Wesleyan, and Roman Catholic services were held over the grave. The Bishop of St. Albans pronounced the Benediction. The Roman Catholic service was conducted by Bishop Keatinge, formerly principal Roman Catholic Chaplain to the Forces. Then a firing party of the Royal Air Force fired three blank volleys over the grave. Trumpets by the grave side sounded the "Last Post," and were answered by other trumpets outside the cemetery sounding the "Réveillé."

#### Careers of Some Other Victims

In our last issue we gave brief accounts of the careers of several of the more notable passengers and officials on board R 101 when she was lost, but pressure of space prevented our dealing with all of them. We now give some notes on four of the victims which had to be held over last week.



The funeral passing the Cenotaph in Whitehall

#### THE LOSS OF THE A.I.D.

Major Percy Bishop, O.B.E., Chief Inspector of Aircraft in the A.I. Directorate of the Air Ministry, had held that post since March, 1918. Previously, he had been designer and Chief Inspector at the Royal Aircraft Establishment (previously Factory) at South Farnborough. He had been educated at Kendrick School, Reading, the Regent Street Polytechnic, and Sheffield University. He served an apprenticeship at Messrs. Clement Talbot, Ltd., and D. Napier & Son, Ltd. He was an A.M.I.A.E. and A.F.Ae.S. Extremely popular with all who knew him, he will be particularly remembered for his connection with sport in the Air Ministry. When younger, he played for the Wasps Rugby Football Club, and in recent years he was chairman of the Air Ministry Athletic Association and the Air Ministry Football Club.

Alexander Bushfield was Assistant Inspector of the A.I.D. since 1923. After serving an apprenticeship as an engineer in Glasgow, he joined the Royal Navy in 1900. He took his ticket as an airship pilot in very early days. During the war he was employed as an overseer in airship construction, and was on the trial flights staff. He was granted the rank of Flying Officer in the Royal Air Force. In 1921 he was highly commended by the Air Council for his courageous and resourceful action in extinguishing a petrol fire in R 36 at the Inchinnan airship works.





"Daily Mirror" Photo.)

#### AUSTRALIA'S LOSS

In Squadron-Leader William Palstra, M.C., B.A., p.s.a., the Royal Australian Air Force has lost a very brilliant officer. He served during the war in the 39th Battalion, Australian Infantry, and afterwards in No. 3 Australian Squadron of the Flying Corps. He won his Military Cross while in the Infantry. During the attack on the Hindenburg line in September 26-29, 1918, he highly distinguished himself as a pilot of No. 3 Australian Squadron. After the war, he went to Melbourne University, graduated B.A., and was then employed in an administrative capacity at the University. On August 10, 1925, he was commissioned as Flying Officer in the Royal Australian Air Force. He was promoted to Flight-Lieutenant in 1927 and to Squadron-Leader in 1930. Last year he went through the R.A.F. Staff College at Andover and subsequently was appointed Australian Liaison Officer at the Air Ministry until last month. He then took a course in air navigation at Calshot. He leaves a widow and three children.



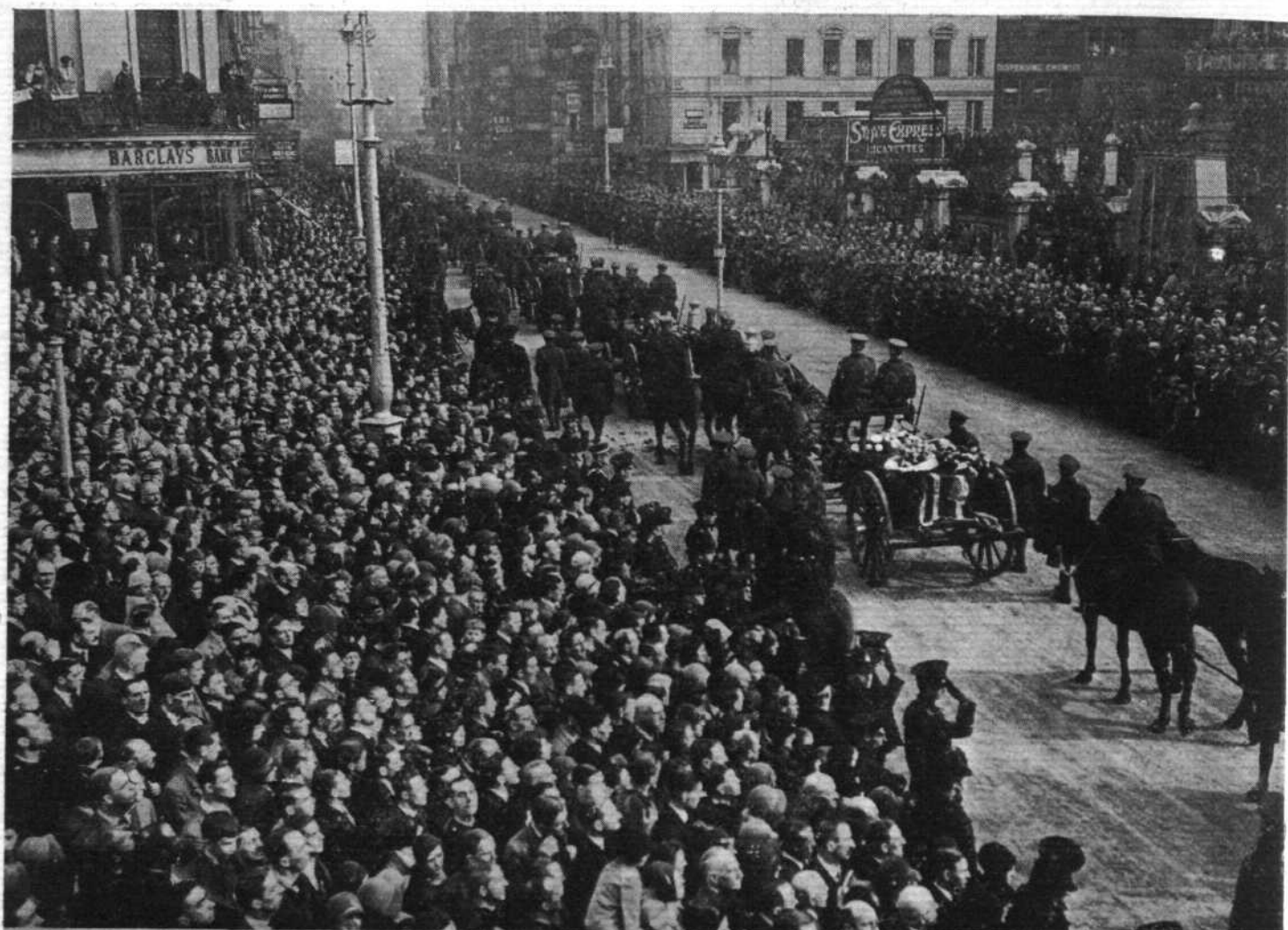
Mourners' cars in Aldwych.  
(FLIGHT Photo.)

#### ASSISTANT DIRECTOR OF CIVIL AVIATION, INDIA

Squadron-Leader William Hickley Lovell O'Neill, M.C., was born at Nasirabad, India, in 1890, and after passing through Wellington College and Sandhurst, he was commissioned in the Indian Army. His regiment was one of the famous Frontier Force regiments, then known as the 51st Sikhs F.F., now the 1st Sikh Battalion, 12th Frontier Force Regiment. This regiment formed one of the 28th Frontier Force Brigade, which was the only Indian Brigade which did not include a British regiment, a testimony to the high opinion held of the Frontier Force. The Brigade took part in the defence of the Suez Canal early in 1915, and then was sent to put matters straight at Aden, which it speedily accomplished. The brigade then formed part of one of the relief columns which tried to relieve Kut. Lieut. O'Neill was Brigade Signalling Officer, but had to take command of his regiment when all the other officers were killed or wounded in the battles of January, 1916. In the attack on Sannaiyat in the next April, Lieut. O'Neill was wounded twice, but was back with his regiment by September. In January, 1917, he joined the R.F.C. as an observer, but after being injured in a crash, he rejoined his regiment in Palestine in 1918, and took part in the final victory there. He received his Military Cross that year. In 1919 he received a permanent commission in the Royal Air Force and resigned from the Indian Army. Next year, however, he passed through the Staff College at Quetta. Lately, he had been stationed at Karachi Aerodrome. He embarked on R 101, and was proceeding to India to take up the appointment of Assistant Director of Civil Aviation.

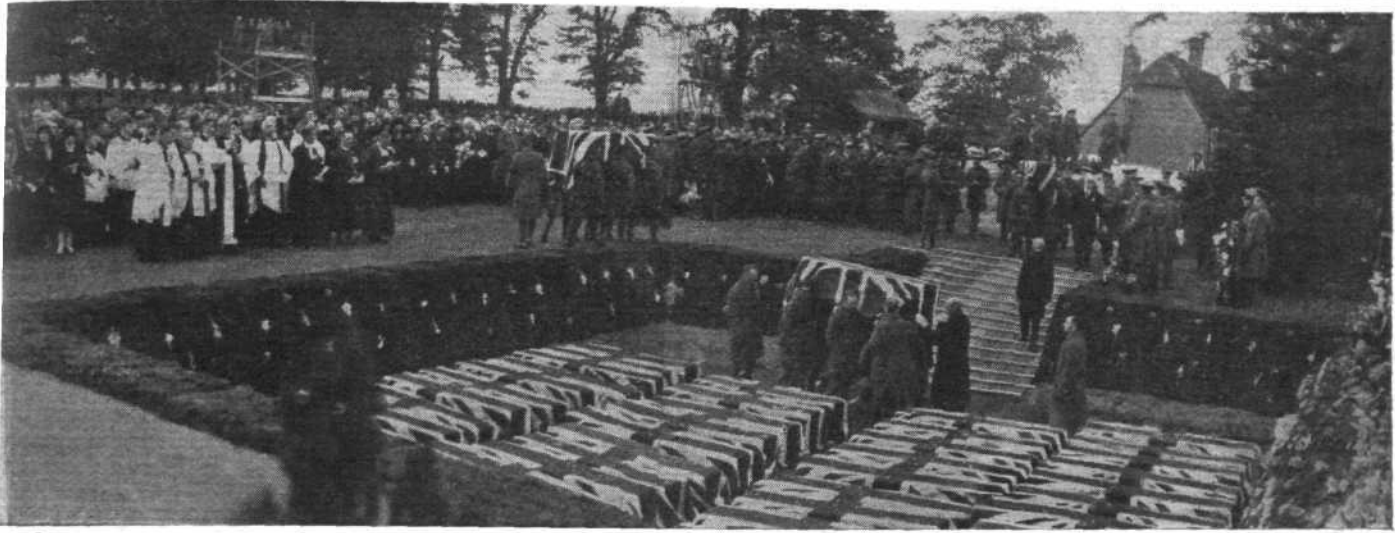
#### Valued Sympathy

The disaster to R 101 has called forth expressions of sympathy from all parts of the world which are very highly



The top illustration shows the funeral cortege passing Charing Cross Station. The lower picture shows the R.A.F. contingent marching along Aldwych. (FLIGHT Photos.)





Laying the 48 coffins in the grave at Cardington. (Graphic Photo Union.)

valued by the whole British nation. First and foremost, France has won our deep gratitude for the way in which the President, the Air Minister, and all sections of her people did every single thing which was in their power to help and succour the survivors, rescue the bodies of the dead, guard the wreckage, assist in the all-important enquiry, and pay tributes to the dead such as have seldom been paid to foreigners who have lost their lives on French soil. King George has expressed the feelings of the British people by conferring on the French Air Minister, M. Laurent Eynac, the honour of Knight Grand Cross of the Most Excellent Order of the British Empire. Whether the French Air Minister will use a British title in his native land we do not know, but to us British he is henceforth Sir Laurent Eynac, G.B.E.

The sympathy of the United States immediately took a very practical form. Hitherto the export of helium from the United States has been prohibited by law. A monopoly of this non-inflammable gas might well be of first-class importance in a war. Admiral Moffett, chief of the U.S. Naval Air Service, who is largely responsible for the building of the Goodyear airship "Akron," and Mr. Britten, Chairman of the Naval Affairs Committee, immediately urged Congress to authorise the export of helium so that British and German airship experimenters should be saved from the fear of fire. It will be remembered that when the "Shenandoah" broke up in a line squall there was no fire, and the majority of those on board survived.

German sympathy was expressed by Dr. Eckener and Captain von Schiller of the "Graf Zeppelin" coming over to attend the funeral of the victims. Dr. Eckener has stated that he was up in the "Graf Zeppelin" on the night when R 101 was destroyed, and he found the weather conditions particularly difficult. He has offered to place a detailed account of the conditions that night before the British commission of enquiry. He has also stated that he will place Zeppelin experience at the disposal of British airship authorities in

other ways. It is evident that Dr. Eckener feels that airship progress is an international interest, and that German airship interests would undoubtedly be prejudiced if Great Britain were to abandon airship work as a result of this catastrophe. His offers of help are generous, and, whatever our future policy may be, we are grateful to him.

The Prime Minister sent the following telegram to Dr. Eckener:—

"Before you leave this country I wish to thank you, and through you the German nation, most warmly for the deep sympathy which you have extended to us in our grief at the disaster to R 101. The presence of yourself and Captain von Schiller, of the Zeppelin Company, at the ceremonies in London and at Bedford last Saturday was clear proof of the bond which unites airmen of all countries.—RAMSAY MACDONALD."

FLIGHT has received the following letter from the editor of *Flugsportliche Rundschau* of Berlin-Johannisthal:—

"Shocked by the news of the terrible disaster which has befallen the airship R 101 and her crew and wiped out the élite of English aviation, we desire to express our heartfelt sympathy.

"Almost exactly 17 years ago Johannisthal witnessed a similar disaster to a Zeppelin airship, in which, too, many valuable air experts met a sudden death.

"Thus, it seems fitting that precisely our paper, which was founded in Johannisthal in 1911 and which recently had the honour of making known to the German daily Press England's sincere appreciation with regard to the Wasserkuppe, should convey to you and to the English people our deepest sympathy."

The editor of *Flug* of Vienna wrote:—

"Shaken by the grave disaster of 'R 101,' the Editor and the editorial Staff of our journal beg to accept our deepest regret in consideration of the terrible loss of such valuable personalities of the British Aviation."



#### R 100

On Wednesday last a rumour was going round to the effect that the Air Ministry had ordered all work to be stopped on R 100. In reply to enquiries the Ministry issued the following statement:—"The present intention of the Air Ministry is to avoid new commitments and the inception of any work which might prove to be unproductive, at the same time avoiding, as far as is economically possible, the discharge of personnel who would subsequently have to be re-engaged." This may be taken to imply that work at present in hand on R 100, such as repairs to the installation of the fuel tank which fell after the return of the airship from Canada, will be completed, though new work will not be started. We understand from other sources that Lord Amulree, who started work as Air Minister on Wednesday, is taking active steps to set up the court of enquiry, and that it is possible that the names of the members may be known by the end of this week.

#### Aid for Dependants of R 101 Victims

It is understood that the Air Ministry has under consideration a scheme for making provision for the dependants of the R 101 disaster. The scheme is to be submitted to the Treasury for approval.

In the meantime steps have already been taken to meet the immediate needs of the dependants. Most of those on board the R 101 were civilians employed by the Air Ministry, and special grants will be necessary.

The chairman and treasurer of the Shaftesbury Homes and Arethusa Training Ship has written to the Press, saying, in November there will be a few vacancies for girls in the Shaftesbury Home at Esher Place. "These," he wrote, "with some vacancies for boys on Arethusa Training Ship, we will gladly reserve for any children of R 101 heroes, of suitable age, for whom a home and training may be desired."

# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

## Report of the Meeting of the Committee of the Royal Aero Club held on Wednesday, October 8, 1930, at 5 o'clock

**Present.**—Lieut.-Col. J. T. C. Moore-Brabazon, M.C., in the Chair; Griffith Brewer; Captain H. S. Broad; Lieut.-Col. M. O. Darby, O.B.E.; Major A. R. Goodfellow; John Lord; Lieut.-Col. Sir Francis K. McClean, A.F.C.; F. Handley Page, C.B.E.; Major H. A. Petre, D.S.O., M.C.; Air Commodore C. R. Samson, C.M.G., D.S.O.

In attendance, H. E. Perrin, secretary; B. Stevenson, assistant secretary.

**Election of Members.**—The following were elected members:—James Scott Anthony, Humphrey Cecil Cayrl, Pilot Officer John Grierson, James Sidney Donaldson Hyslop, Joseph Russell Knowles, Charles F. P. Lowe, Patrick Stuart Murray Reid, Trevor A. B. Ternan, George Noel Wilson, William Lee Woodward, Humphrey Osmond Wrigley.

**Aviators' Certificates.**—The following Aviators' Certificates were granted:—Nos. 9409—9494. (A list of these will be published in next week's issue of FLIGHT.)

**R. 101.**—The following resolution was unanimously passed:—

"The Committee of the Royal Aero Club desires to place on record its great sorrow at the disaster to the airship R 101, and the loss of so many valuable lives.

"Lord Thomson, as Chairman of the Club in 1926-8, won the esteem of all members by his energetic and unfailing support to the cause of aviation and, as Secretary of State for Air, by his selfless devotion in advancing Empire air communications.

"Sir Sefton Brancker, as a member of the Committee and Chairman of the Racing Committee for many years, rendered invaluable service to the club. As Director of Civil Aviation, he stimulated British aerial effort throughout the world, and his enthusiasm, tireless activity and goodwill won admiration and respect from all who came in touch with him."

Offices: THE ROYAL AERO CLUB  
3, CLIFFORD STREET, LONDON, W.1.  
H. E. PERRIN, Secretary

## Steam-Cooled Aero Engines

THE Fairey Aviation Co. have recently carried out flying tests with a Fairey "Fox" day-bomber fitted with a steam-cooled engine. With this system the usual water radiator is dispensed with, and in its place is a condenser in the leading edge of the wing, which condenses the steam generated in the cylinder water jackets. This device not only reduces frontal area, but the total weight is also reduced—the amount of water required being much less and the condenser weighing comparatively little. The tests were apparently successful, the machine being put through the usual high speed, climbing, and aerobatic tests.

## The Inter-Club Glider Competitions

WITH reference to the Inter-Club Competitions which the British Gliding Association are arranging for this coming week-end, unfortunately, they have had to change the ground at the last minute and the meeting is now to be held at Ditchling Beacon.

## "Air Transport in Fog"

"In conclusion, I would say that air transport in fog is immediately practicable, but that it involves an element of risk which will continue until all the equipment required has been proved by many years of actual use." The above is a quotation from the important lecture by Mr. F. W. Meredith which will be delivered before the Royal Aeronautical Society on Thursday, October 23, 1930, at 6.30 p.m., in the Lecture Hall of the Royal Society of Arts. The subject-matter of Mr. Meredith's lecture is one of outstanding importance on the future of civil aviation. In the course of his paper Mr. Meredith outlines the progress which has already been made and the lines of future development.

## Westland Aircraft Society (Yeovil Branch, R.Ae.S.)

THE following is the proposed syllabus of lectures for the forthcoming session of the above society. The Annual General meeting, was held on Oct. 10.

- 1930.—  
Oct. 17.—"Gliding and Soaring," Col. the Master of Sempill, A.F.C., A.E.R.Ae.S., at Assembly Rooms, Yeovil.  
Oct. 23.—"Model Aeroplanes," Mr. E. Voss, at Three Choughs Hotel.  
Oct. 30.—"Ground Engineers Lecture," Mr. W. J. Norton, A.I.D., at Three Choughs Hotel.  
Nov. 6.—Film Display, at Three Choughs Hotel.  
Nov. 13.—"Triplex Glass Making," by a Representative of Triplex Safety Glass Co., Ltd., at Three Choughs Hotel.  
Nov. 20.—"Aircraft Detail Design. The Shops Viewpoint," Mr. W. Geo. Gibson, A.R.Ae.S., at Three Choughs Hotel.  
Nov. 28.—"Westland Wapiti in India," Group Capt. R. H. Verney, O.B.E., at Three Choughs Hotel.  
Dec. 5.—"Recent Long-Distance Flights," Capt. C. D. Barnard, at Assembly Rooms, Yeovil. (To be confirmed.)  
Dec. 11.—"Float and Boat Seaplanes," Mr. Jackson, of Messrs. Short Bros., at Three Choughs Hotel.  
1931.—  
Jan. 8.—"Aircraft Production Methods in America," Mr. R. A. Bruce, O.B.E., at Three Choughs Hotel.  
Jan. 17.—Conducted tour of Petters, Ltd. Engine Works and Foundry.  
Jan. 22.—"Model Aeroplanes," Mr. W. Rigby, at Three Choughs Hotel.  
Jan. 29.—"Machining and Working of Stainless Steel," Mr. R. Waddell, of Messrs. Brown Bayley's Steel Works, Ltd., at Three Choughs Hotel.  
Feb. 5.—"Westland Wapiti in Australia," Sqdn.-Ldr. C. T. Anderson, D.F.C., R.A.F., at Three Choughs Hotel.  
Feb. 12.—"Spinning," Mr. S. Scott-Hall, of Martlesham Heath, at Three Choughs Hotel.  
Feb. 19.—"Layout and Equipping of Service Aircraft," Sqdn.-Ldr. R. S. Sorley, D.S.C., D.F.C., R.A.F., at Three Choughs Hotel. (To be confirmed.)  
Feb. 26.—"Latest Aircraft Instrument Developments," Maj. C. J. Stewart, O.B.E., the Royal Aircraft Establishment, Farnborough, at Three Choughs Hotel.  
Mar. 7.—Visit to Sherbourne School, by kind permission of C. L. Fletcher Boughey, M.A.  
Mar. 12.—"Metals," Mr. W. J. Norton, A.I.D., at Three Choughs Hotel.



THE "GIPSY MOTH" IN CANADA: A fleet of de Havilland "Gipsy Moth" aircraft used by Nos. 1 and 2 Training Squadron, R.C.A.F., Camp Borden, taken on the occasion of their annual Display at the Canadian National Exhibition, Toronto, September 30, 1930.



# AIRISMS FROM THE FOUR WINDS

## The Race to Australia

THE various flights now in progress to and from Australia are quite bewildering. That wonderful record set up by Bert Hinkler in 1928 looks like being beaten at last. There are—as far as we know at the moment of going to press—five Australian flights under way (four "out" and one "home") as follows:—Flt.-Lt. C. W. Hill, R.A.F., Henlow, who left Lympne on October 5 in a "Gipsy Moth"; Maj. C. E. M. Pickthorne and F/O. C. W. Chabot, who left Croydon on October 6 in a "Puss Moth"; Wing-Comdr. Kingsford Smith, who left Heston in his Avro "Avian" (Gipsy I); Capt. F. R. Matthews, who originally started from Croydon on September 16 in a "Puss Moth"; and Mr. A. T. Cunningham, who left Australia for England on August 5 in a Genairco biplane. Hill, by getting in some night flying, has made wonderful progress, and is at present two days ahead of Hinkler. After arriving at Constantinople on October 7, he, together with Pickthorne and Chabot, were held up by bad weather all the next day, and did not get away until October 9, when they reached Aleppo. Pushing on next day, Hill reached Bushire, on the Persian Gulf, but his two "rival" companions were not so fortunate, and force-landed at Lingah, in Persia, and were held up by a burst tyre and passport troubles! Meanwhile Hill hurried on, and arrived at Karachi on October 11, having accomplished the journey to India in seven days—one day ahead of Hinkler and one day behind Miss Amy Johnson. Next day he flew on to Allahabad, and after making repairs to a leaky petrol tank, left again at 10 p.m. for Akyab, which he reached early next morning, October 13. Pushing on an hour later, he arrived at Rangoon after six hours' flying—and nine days after he left England. He left next day for Singapore, but at the time of writing no news of his arrival there has been received. In the meantime, Pickthorne and Chabot cut their way free from Persian red tape and arrived at Karachi on October 13, but decided to abandon the race and return home. And now for Kingsford-Smith: he reached Rome the same day he left Heston (October 9), and made the following rapid stages:—October 10, Athens; October 11, Aleppo; October 12, Bushire; October 13, Karachi (a record trip, two days ahead of Hinkler and one ahead of Miss Johnson); October 14, Allahabad; October 15, Rangoon. Matthews, who has been held up for some time in Siam, resumed his flight from Bangkok on October 7, and after yet another forced landing, arrived at Singapore on October 12 and left for Batavia on October 14. Finally, Cunningham, flying from Australia—with many set-backs—reached Calcutta on October 16, and stated that he had decided to abandon the flight.

## A Record African Flight

A SPLENDID flight from England to Cape Town has just been accomplished by Mr. R. F. Caspareuthus—a South African, late of the R.A.F.—who has made the 8,000-mile journey in the record time of 9½ days. Piloting a D.H. "Puss Moth" (Gipsy III engine) belonging to Mr. Marshall, of Port Elizabeth, he left Croydon on October 5, and five days later he arrived at Cairo, via Marseilles and Athens. Then, following the route of the forthcoming Imperial Airways service, made good daily progress to the Cape, arriving at Maitland Aerodrome, Cape Town, on October 13, an hour before he was expected. He thus beat the Duchess of Bedford's and Capt. Barnard's record by nearly a day—his total flying time was 78 hours. He stated that he was forced down by storms to a few hundred feet at Beauvais shortly after the disaster to R 101, but saw no signs of it.

## Boyd and Connor Fly the Atlantic

CAPT. ERROLL BOYD, late of the R.A.F., a Canadian pilot, together with Lieut. Harry Connor, late U.S. Navy, navigator, flying the Bellanca monoplane with Whirlwind engine, named *Miss Columbia*, in which Clarence Chamberlin and Mr. Levine flew the Atlantic in 1927, left Harbour Grace, Newfoundland, on Thursday, October 9, at 11.20 a.m. (4.20 p.m., G.M.T.) and landed on the beach at Tresco, Scilly Isles, on Friday evening, after flying for about 23½ hours. The rear petrol tank was not functioning properly, and this forced them to land; they dumped the faulty tank into the sea. Next day they got petrol from a seaplane from Mt. Batten and flew on to Croydon. Here they were greeted by a large crowd, and one of the first to welcome them was Mr. Charles Levine himself.

## R.A.F. African Flight.

ON October 19, a Squadron of the Royal Air Force will set out on another Service tour to blaze the trail in Africa. No. 47 (Bomber) Squadron, composed of Fairey-Napier 111F

aircraft, under the command of Squadron Leader E. L. Howard-Williams, M.C., has been selected to carry out this important flight and new routes will be opened up in a tour in West Africa. Starting from Khartoum, the chief places of call will be El Fasher (Sudan), Fort Lamy (Chad), Kano and Sokoto (Nigeria), Ouagadougou (Upper Volta), Bamako (French Sudan), Freetown (Sierra Leone) with Bathurst Gambia as the destination. The tour is timed to finish at Bathurst on November 3, and the return flight will begin on November 8, via Kayes, in French Sudan. It is expected that Khartoum will be reached on November 21.

## Handley Page Slots in Australia

IN carrying out its purpose of fitting the Handley Page automatic slots to all its North-west service machines, West Australian Airways have now completed work on two De Havilland "50" machines. Tests under flight conditions with full load have revealed a marvellous safety margin, thus making the machines practically foolproof. Work on other machines is proceeding and should be completed shortly.

## The Berlin-Tokio Flight

THE Japanese pilot Yoshihara received a magnificent ovation when he landed at Tokio on the completion of his successful flight from Berlin on a Junkers Junior Genet-engine light aeroplane. He was treated like a national hero and representatives of the government were present to welcome him. The press was full of the flight and great festivities were arranged in honour of the pilot. The following is a list of the stages of the journey:—

1st day	..	Berlin-Moskow	..	..	1,442 km.
2nd "	..	Moskow-Seima	..	..	657 "
3rd "	..	Seima-Kazan	..	..	510 "
4th "	..	Kazan-Novosibirsk	..	..	2,299 "
5th "	..	Novosibirsk-Krasnojarsk	..	..	758 "
6th "	..	Krasnojarsk-Verchneudinsk	..	..	1,162 "
7th "	..	Verchneudinsk-Chita	..	..	502 "
8th "	..	Chita-Karbin	..	..	1,350 "
9th "	..	Karbin-Keijo	..	..	1,180 "
10th "	..	Keijo-Osaka	..	..	970 "
11th "	..	To Tokio.	..	..	

Total flying time: 9 days 22 hrs. 10 mins.

Taking into consideration the difference in time the above schedule gives a daily average of over 1,000 km., which is even better than Squadron Leader Bert Hinkler's record during his Australian flight, when an average of approximately 850 km. per day was put up. This fine flight to the Far East is splendid tribute to the reliability of the Armstrong Siddeley 80-88 h.p. Genet engine, which ran without a fault the whole of the journey.



The Japanese pilot, Mr. Yoshihara, with his Armstrong-Siddeley Genet-engined Junkers Junior, in which he recently completed a flight from Berlin to Tokio via Siberia within a week.

# AIR TRANSPORT

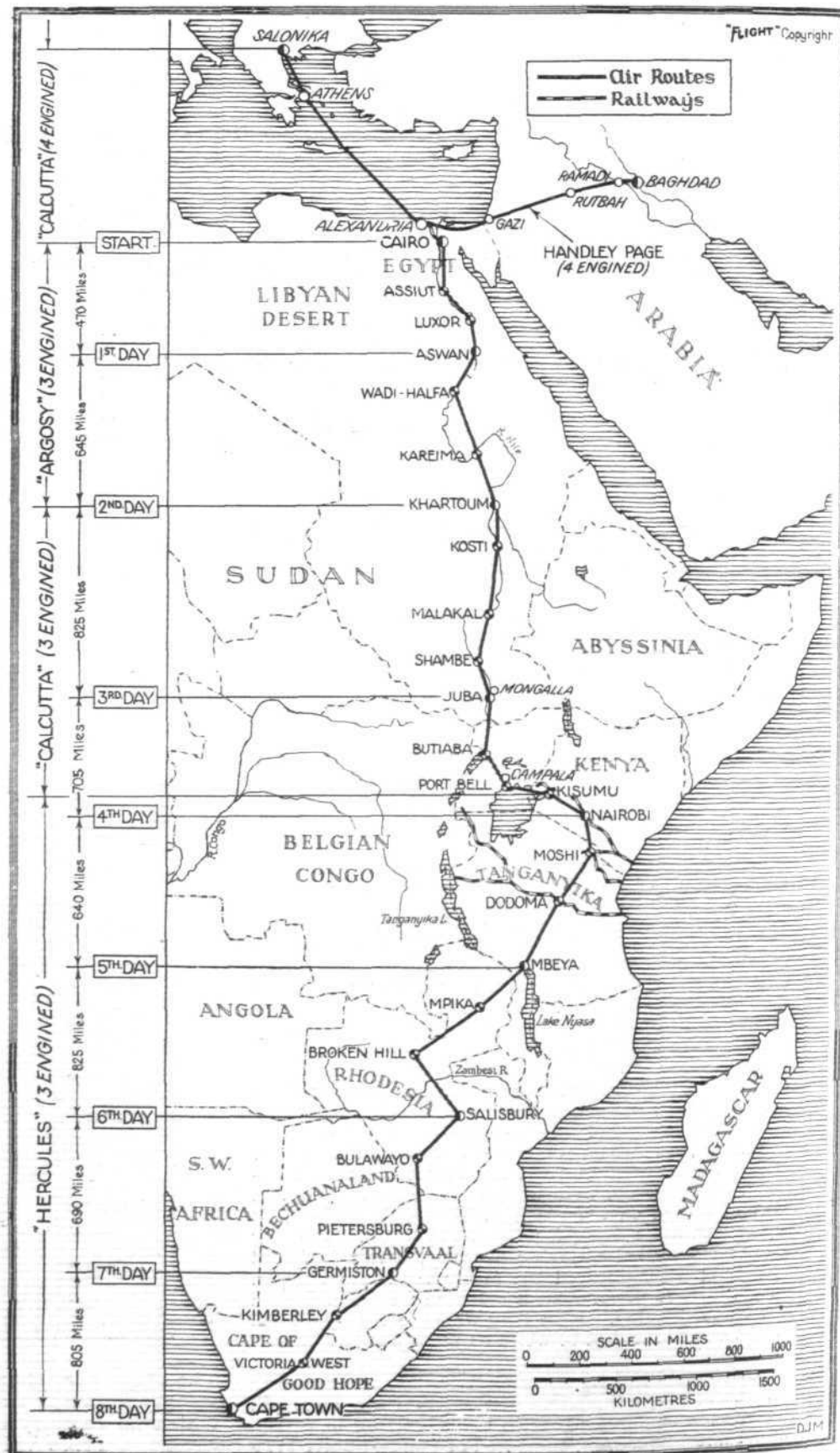
## THE AFRICAN AIRWAY

IN our issue of October 3 we gave an account of the airway across Africa which is to be opened shortly by Imperial Airways, Ltd. In the present issue, we add to this a full description of the new four-engined Short "Calcutta" which is to be used on the Mediterranean section of the route, and we also publish herewith a map of the airway which shows the stages, the distances between halting places, the stations where nights are spent, the type of aeroplane used on each stage, the junctions with railways, and the boundaries of the countries traversed. We also publish a graph, reproduced from *Imperial Airways Gazette*, which shows the comparative time taken by air and by ground communications to reach the various important towns on the route. It will be noticed that the saving of time by using the airway is considerably greater in the case of towns in Central Africa than in the case of the larger towns of the Union, which can be reached by regular steamer and train services.

The allocation of aircraft to the various stages is admittedly temporary. Two new types will be available by the spring and will forthwith be put in operation by Imperial Airways. These are the new 40-seater Handley Page, with four "Jupiter" engines and the new Short "Calcutta," also driven by four "Jupiters." These two types, however, will not be used on the airway from Cairo to Capetown. The Handley Page landplanes (European type) will ply between Croydon and Salonika, or whichever port is ultimately selected. The new "Calcuttas" will carry out the crossing of the Mediterranean between Salonika and Alexandria. From Cairo, new Handley Pages (Eastern type) will carry on the route across the desert to Baghdad and Karachi. The Cairo-Capetown service will be operated by the older, but still eminently sound, types still in possession of Imperial Airways. From Cairo to Khartum the "Argosy" landplanes (three in number) will carry on, improved by the installation of geared "Jaguars." From Khartum to Kisumu it is not advisable, at present, to use landplanes, as the aerodromes are not firm enough to support large machines in the rainy season. In time, suitable sites for aerodromes which can be used all the year round may be found. One such has already been found at Juba. But in the meantime it is preferable to use flying boats which can use the Nile and the Great Lakes as harbours and as emergency landing places. The "Calcuttas," with three "Jupiter" engines, will be put on to this section. Three of this type are available.

At Kisumu the seaplanes have accomplished their work. The route leaves the lakes and follows the railway to Nairobi. So a change is made at Kisumu. From there the remaining stages are to be carried on by the well-proved "Hercules"

machines, each with three "Jupiters," which have done such fine service between Cairo and Karachi. Four "Hercules" machines are available to open the service. These machines take over for the last stage of the fourth day, from Kisumu to Nairobi, and carry on for the last four days of the journey. We thus see that between Cairo and Capetown three separate types of machine will be used, "Argosy," "Calcutta," and "Hercules"; while both "Jaguar" and





"Jupiter" engines will be used. We do not wish to give the impression that Imperial Airways are merely using up obsolescent types on the African air route, for all these types are of extremely good quality. They may perhaps carry somewhat less pay load in African conditions than the "Argosy" machines, for example, were accustomed to carry in Europe. This will be an additional safeguard, and the capacity will still be ample for anything likely to be expected in the early days of the service. We have mentioned above that the "Argosy" machines will have geared "Jaguars" in them, which will still further increase their efficiency. The fact is that the use of diverse types will be a useful means by which Imperial Airways can accumulate data showing what is most useful for the new conditions with which they have to deal. It is natural that the new types should be placed on service first over the two sections up to Alexandria, which are common to both the African and the Indian airways, as the new types are more capacious and will be in a better position to cope with double supplies of traffic. It is also natural that, in allocating the new Eastern type Handley Page machines, the route which has already been established and where the amount of traffic to be expected is fairly well known, should receive preference over the new route, where the volume of traffic is unknown. In any case, traffic on a new airway is always apt to be cautious at the first, though it will grow as confidence in the new means of transport is established. That has been the experience of the Australian airways, which are the oldest of all British long-distance airways, and so afford the best data. Imperial Airways hope to collect data from the running of these three diverse types, which will enable them to specify one type suitable for all African conditions, though it may be necessary to use this type as a landplane on some sections of the route and as a seaplane on other sections.

The following extracts from the *Imperial Airways Gazette* will be read with interest:—

"The accommodation of passengers, mails and freight and the claim for the inclusion of every place of importance in the schedule of ports of call demands the production of a type of machine to embody several often conflicting characteristics. Passenger accommodation must be roomy so that much of the space is wasted as a load accommodator, and the increased dimensions mitigate against high speed—the loss of speed reduces range, and the inclusion of too many calling points reduces the day's run to the prejudice of the principal value of an air service. Moreover, air routes can show their greatest flexibility and highest average performance only when following a firmly established and well-developed line of ground communication. Like Napoleon's army, which "travels on its stomach," on its ability to keep up its line of commissariat and 'points d'appui,' air lines depend on a chain of depots, being themselves in quick and

ready contact with each other and the outside world. It is the existence of this feature which has given the American Air Lines such a tremendous advantage over those of our own Imperial routes, and the absence of this feature is more handicapping than the prevalence of adverse weather conditions.

"On the African route, until the South African Railway system is reached at Broken Hill, there is a most conspicuous lack of ground communications either along the same route or connecting it with any other highway by sea or land; while even at Broken Hill, the railway is of little value and does not really assist until the last section Johannesburg-Cape Town is reached."

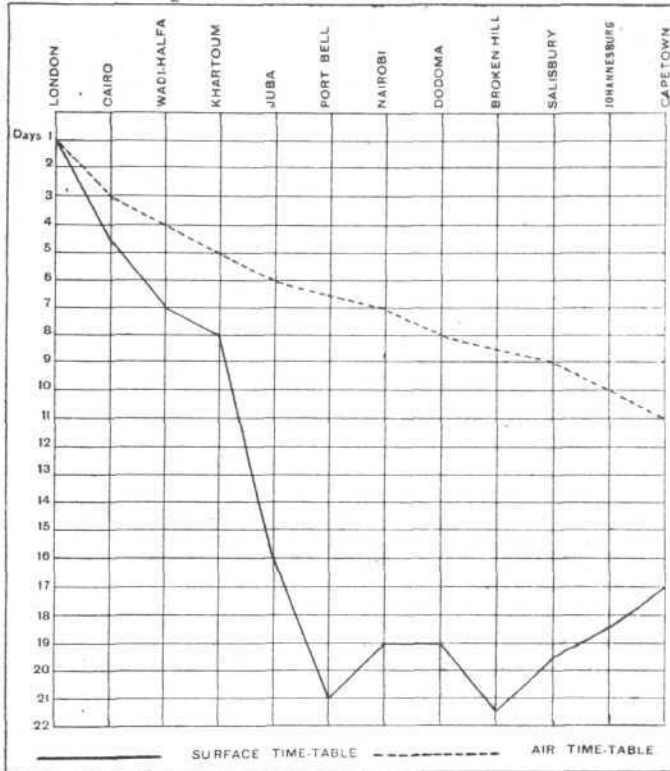
"On all Imperial Airways Overseas routes every machine is of the multi-engined type. The total horse-power developed is nearly double what is sufficient to maintain the machine in horizontal flight, which alone ensures that when all engines are running together each is called upon to perform a duty well below its capacity and thus the reliability of each engine is abnormally high. Should, however, one fail, the remainder are still not required to work up to their maximum capacity and are not thus overtaxed to the prejudice of their reliability.

"A fleet of such machines, each with three engines, will be distributed along the route so that each is relieved in turn after a sufficient period of active duty by another, fresh from the care of the maintenance staff. These relief aircraft are so stationed that the change from one machine to another is made at different places in the two directions of the service, thus providing an extra reserve in the event of abnormal trouble."

"The difficulty thrown in the way by low density atmosphere under conditions of great heat or altitude are guarded against by providing in the specification of the aircraft for a performance which is adequate under the normal conditions of these adverse factors. When they surpass the normal, as they may do in the height of summer or in other circumstances, additional precautions are adopted to meet the contingency by the further reduction of the loaded weight of the machine, and all such precautions are regulated by instructions issued under Government ordinance and subject to the Government's power of inspection."

"In all, there are 26 air stations for regular call, at eleven of which the Company is erecting Rest Houses or Refreshment Bungalows as well as buildings in which permanent residential staff can be quartered, to serve as nuclei for extension of lateral services and to ensure the provision of sufficient inspection and relief personnel to cover all reasonable emergencies.

"The inauguration of the service will be made in the early weeks of 1931, with the opening of the first sector from Cairo to Kisumu and Nwanza on Lake Victoria, to be followed within a short time by the opening of the remaining sector to Cape Town."



This graph shows the comparative times taken to reach the chief points on the African airway (a) by air, and (b) by land and water.

### West Australian Airways Statistics

*Airways Bulletin* gives the following statistics regarding West Australian Airways services up to July 31, 1930:—Passengers carried: (Perth-Wyndham), 7,446; (Perth-Adelaide), 3,960; taxi and joy-ride, 15,928. Machine flights: 10,574. Miles flown: 1,574,384. Letters carried: (Perth-Wyndham), to May 31, 1,775,844; (Perth-Adelaide), 40,756 lb. Freight carried: (Perth-Wyndham), 322,073 lb.; (Perth-Adelaide), 26,175 lb.

The same issue of the *Bulletin* states the following:—

"Recent questions in the Federal Parliament indicated the seriousness of the competition of Airways Perth-Adelaide Service with the trans-Continental trains, the main contention being that the Government subsidy enabled the public to enjoy air travel at train fares, and thus take passengers from the railways. It should be noted that the low air fares operating at present are a winter concession, and the result has been that practically all the seats in the aeroplanes have been filled every trip. The principal justification for this air service is the speeding up of English mails to and from

the Eastern States, but the lack of publicity abroad has resulted in practically no mails being carried, and the lifting capacity not availed of by the Government is thus at the disposal of the company, and is being used with 100 per cent. effect. Over 4 per cent. of the outward-bound mail from the Eastern States is carried by air, while on our North-west coast 40 per cent. of the mail is carried by that widely known service. But of the 15 tons of incoming weekly mail which steamers land at Fremantle for conveyance to the Eastern States, not one-half of 1 per cent. is carried by air, solely because of absence of essential publicity abroad. While such a state of affairs exists, the local travelling public are appreciating the speed and comfort of air travel, and when they compare the long journey by rail with its several breaks of gauge they realise the significance of the words credited to Mr. Henry Ford, 'Now that man has wings no power on earth will hold him back.' After all, it is generally recognised that improvements in transport facilities between important centres have beneficial effects on traffic, and the railways should also benefit in the new business thus created."

#### The Wiluna Goldfields Air Service in Australia

THE new air service, recently inaugurated by West Australian Airways to provide an air link between the East-West route and the Wiluna Goldfields, gives every promise of success. The new scheme provides for the keeping of one De Havilland "50" machine at the Kalgoorlie Aerodrome. This machine leaves Kalgoorlie every Monday and Thursday for Wiluna, dropping in at Leonora or at other spots as wanted, where an approved landing ground is provided. The service is expected to be of great value to mine executives, for instead of a tiresome three days' journey, they can leave the Goldfields Express and, joining the 'plane, be in Wiluna in a few hours. Residents of the Wiluna district, both associated with the mines and also the surrounding pastoral areas, have already found the advantage of speedy transport, for now they can receive their newspapers the day after publication in the city, whereas under conditions existing hitherto it was three and four days before the news was brought to them. "W.A.A." point out that those living in the district served by the new service must not, however, forget the obligation which falls upon them, if the service is to be continued. A service of this kind can only be maintained so long as it is patronised, and it is in this regard that those associated with the towns touched at can do much to ensure a continuance of regular visits from the world's most speedy form of transport. Meanwhile, the service is temporarily suspended.

#### Aircraft Business Journeys by Air

THE "Saro Cloud," the latest product of the Saro Amphibian family, flew recently between Southampton and St. Heliers, Jersey, for the purpose of a business meeting between the directors of Saunders-Roe, Ltd., and Kirsten and Mace, Ltd. The former company are interested in the operations of the K. and M. air service from England to (and in the district of) the Channel Islands, where an efficient transport and circular trip service is in regular operation with the Saro "Cutty Sark." The outward journey was made from Southampton to Jersey by the "Saro Cloud" amphibian in one hour and ten minutes in comfort; but the return trip occupied about two hours. When the return was to be made a thunderstorm broke with torrential rain, and after waiting in vain for a weather report, it was decided to attempt the return journey, the visibility being at first very poor but improving as the journey proceeded. Gale warnings were flown, for a whole gale was blowing and the occupants of the "Saro Cloud" felt sorry for the steamer passengers they could see below, as the return flight was made at an altitude of only about one hundred feet, and the Isle of Wight coming at last into view was a welcome sight. The passengers on this occasion were, Sir Alliott Verdon-Roe, Mr. John Lord, Squadron Leader Underhill, Captain Scott (pilot), the mechanic and a lady passenger, all of whom were impressed with the fine performance of the machine under the worst possible conditions.

#### Combined Air, Road and Marine Service

A RECENT high speed service was effected as a result of an urgent telephone call to Messrs. Saunders-Roe, Ltd., when important documents were despatched by air to their Cowes Aerodrome. The company's car was waiting on the Aerodrome to convey these papers and their bearer to the Saro Marine Station, where a fast boat was in readiness, and which at once put off and delivered same aboard the famous outward bound liner "Europa" lying in mid Solent. The return journey from ship to aeroplane was performed in a similar manner, the confidential messenger having little to do, but agree to travel quickly. This service was effected solely within the organisation of Messrs. Saunders-Roe, Ltd., the well known aircraft and marine engineers and yacht builders of East Cowes, and was free from any external aid. It serves to show that the Isle of Wight in general and Cowes in particular is not nearly so isolated as is sometimes supposed, for when using the methods provided and described, it has better outside contact than many larger places not possessing these facilities.

## CROYDON WEEKLY NOTES

THE touching sympathy felt for us by France in our overwhelming loss was further shown on Thursday, the 9th, when a "Golden Ray" machine of the Air Union arrived at Croydon, bringing the French official representatives to the R 101 Memorial Service. The party consisted of M. Laurent d'Eynac, the French Air Minister; M. Chaumie, the Director of Civil Aviation; and General Barras, Chief of the Military Air Service. They were met by His Excellency the French Ambassador, M. de Fleurieu, and Commander Sala, French Air Attaché. Representing H.M. Government was Mr. F. Montague, the Under-Secretary of State for Air. Mr. J. A. Webster represented the Air Ministry, and Air-Commodore W. G. S. Mitchell, C.B., D.S.O., A.F.C., the Royal Air Force.

The machine had passed over the debris of the airship at Beauvais, and dipped in salute. At the official reception, the French Air Minister spoke of the friendship between France and Britain. That union, he said, forged by mutual sacrifices in the war, had been made stronger still. Lord Thomson and Sir Sefton Brancker had been his very dear friends.

Last week we reported the formation of Personal Flying Services, Ltd., to operate a Junkers and a Sikorsky on private charter work. Since then, Major Clark has carried out tests on a Desoutter Mark II, which have resulted in an order being placed for one of these. P.F.S., Ltd., will thus have different craft suitable for almost any conditions and routes.

The A.D.C. Aircraft, Ltd., have now put the Inverted Hermes II into production, and a considerable number are already ordered. On Friday, we had an opportunity of flying behind the first of these new engines. It is being given gruelling tests in the company's Desoutter, and appears to run very sweetly. The absence of noise and vibration were very marked.

In the vernacular of the pilot's room, Bob Little, of long-

distance flight fame, "jumped off the dock" last Thursday, October 9. The wedding took place in Paris, and the regard with which Croydon folk regard both him and his bride, Miss Julie Johnson, was shown by the numbers who managed to turn up. Mr. Little thus becomes the brother-in-law of our American friends, Mr. and Mrs. Stevens who, in spite of all their threats to do so, have not yet returned to the States. The honeymoon is being spent in the Austrian Tyrol.

The navigators' examination is over, and there are signs of relief in the faces of all those who have been through it. It appears to have been the most trying experience that has ever happened to many of these "intrepid bird men." The utility of the diploma is being hotly debated, and one well-known pilot declared that he had never been lost until he became a second-class navigator, and trusted to his slide rule, instead of his instinct. However, if knowledge of the use of a "guessing stick" is instilled early enough in life, it may, to some extent, supplement the lack of experience of the younger pilots.

The mysterious job for which "Nick" Carter left Imperial Airways three months ago is now known to be that of Assistant to Mr. G. W. Higgs, Aviation Manager of the Ford Motor Co., Ltd. Between them, they hope to flood Europe with tri-motor Fords, and the first two for demonstration purposes will be seen at Croydon next week. English aircraft manufacturers will most certainly have to shake up their ideas if they are to meet the competition of this well-tried machine. Except for Mr. A. Robinson, of Imperial Airways, there can hardly be anyone who has had a longer connection with Croydon than Mr. "Nick" Carter, for he served with No. 40 Squadron when the aerodrome was a small field on the west side of the now-extinct Plough Lane.

The traffic figures for the week are 747 passengers and 48 tons of freight.

M. L.



# THE GROWTH OF AVIATION

By C. R. FAIREY, M.B.E., F.R.Ae.S.

At the meeting of the Royal Aeronautical Society, on October 9, Colonel the Master of Sempill, the retiring President, was in the chair. He referred to the shadow which the R 101 disaster had cast over the meeting, and recalled that in the disaster the Royal Aeronautical society had lost some of the most brilliant of its technical members. He was sure it would be their wish that the Society should carry on its work of development of aviation. Messages of sympathy had been received by the society from all over the world. While Col. Sempill read out the names of those lost in R 101 who had been members of the society, the audience paid a silent tribute to the dead by rising to their feet.

Before calling upon Mr. Fairey to read his paper, Col. Sempill reviewed, briefly, the past history of the Royal Aeronautical Society, and pointed out that this was the last time he would have the opportunity of speaking to them as president, since, as soon as Mr. Fairey began to speak, he (Col. Sempill) would automatically become a past-president, and Mr. Fairey the new president.

In introducing the speaker, Col. Sempill disclosed the information that Mr. Fairey was born on May 5, 1887, and that his first achievements in aviation included the winning of all events in a model aeroplane competition in which he took part. Col. Sempill also referred to Mr. Fairey's work with the Blair Atholl Co., and with Short Brothers, before he established his own now famous firm.

Mr. Fairey's paper was one of the most interesting ever presented to the Royal Aeronautical Society, and gave figures not hitherto collected together. This week and next week we are publishing the text of Mr. Fairey's paper, very nearly in full, as well as all the illustrations which accompanied it.

THE statement that Aviation is in its infancy is now the commonest of platitudes, and it is possibly not unbecoming in conscientious parents or guardians to take stock of the growth from time to time of the infant they are interested in—to weigh and measure it with a view to ascertaining whether such growth is normal and uniform, and, more important still, whether the rate of growth is being maintained, is increasing, or diminishing, and to try to ascertain what external influences have the most beneficial effect.

I am aware that in endeavouring to present a picture of the world growth of Aviation I have entered upon a very ambitious project, and I make no pretence but that the figures are broad approximations based on such data as is

available, coupled of necessity with estimates in certain cases.

In technical progress figures are not only easily obtainable, but are officially certified as to accuracy; in other directions the collection of data is not so easy.

In civil operations most of the leading transport companies publish figures of mileage, and of passengers, goods, and mail carried, and in most cases subsidy figures are readily obtainable, but different countries vary greatly in the statistics they provide.

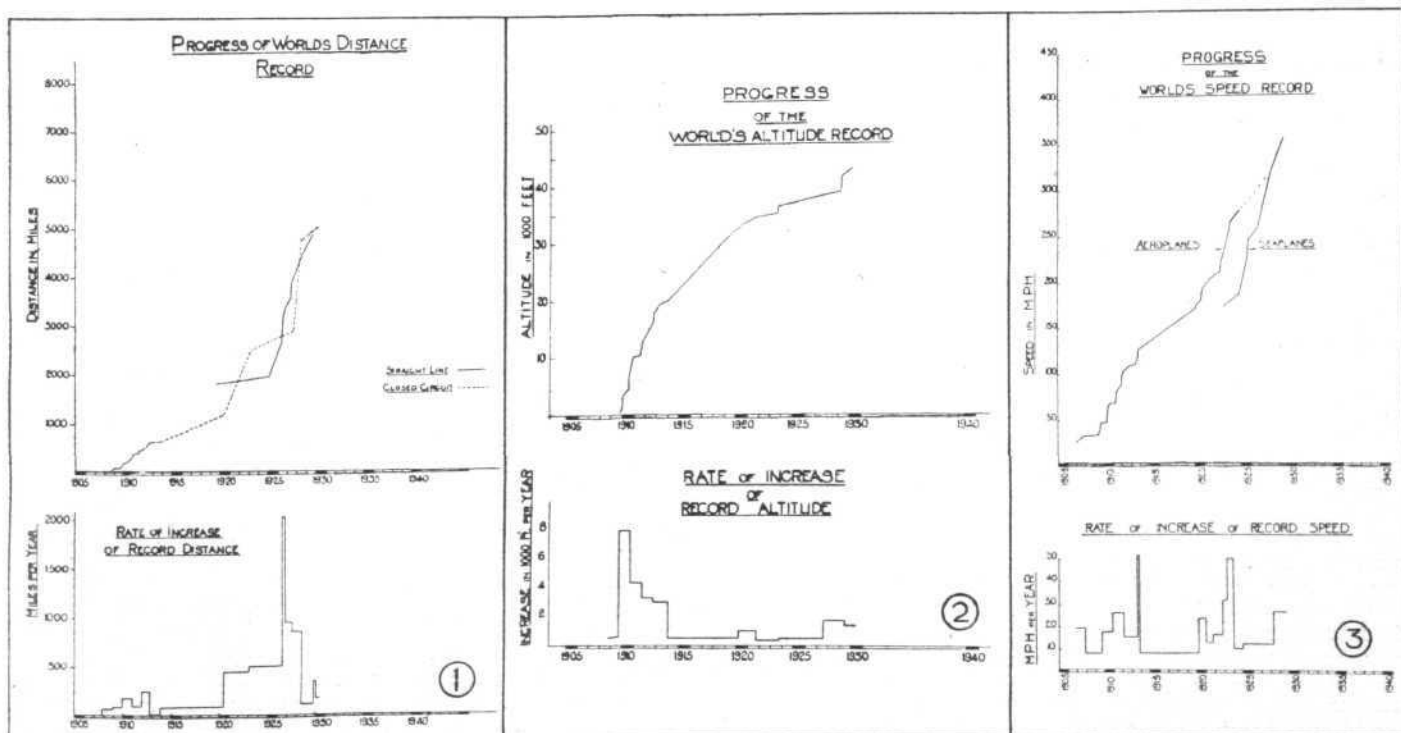
In military aviation most of the great powers make public the sums voted for this purpose, and some the numbers of machines available and on reserve, but others do not. Soviet Russia, for example, does not take the world into its confidence on these questions.

The first question that crops up in examining the growth of aviation is the necessity of a definition of "growth," which obviously is of many kinds. Statistics, particularly when not fully complete, can be highly misleading, and we must be assured that the figures we regard are truly representative of the growth they are intended to portray. The statistics themselves may be quite accurate, but the impression they convey entirely artificial.

Almost in whichever direction one looks for figures with which to represent the normal expansion of Aviation as a whole, one finds some difficulty arising to disturb the results and discredit the figures, so that the only method, presumably, is to quote a great many different features of growth, and to give as far as possible the points on which these are likely to be abnormal, the easiest case being that of technical progress, which we can measure by studying world's records, and the most difficult that of commercial, in which figures are less reliable, and harder to obtain.

Another great difficulty is in dealing with the war period. This period was not, I maintain, a time of great progress technically, although I am aware that is contrary to general belief. It was, on the other hand, quite obviously a period of colossal expansion in manufacture and flying, in numbers of pilots trained, and in workpeople and so forth, familiarised with every aspect of development.

On the other hand, world figures for this period are not obtainable, and if they were so, would only produce a bulge in the curves partly offset by the corresponding slump afterwards. The aftermath was represented by a vast stock of superfluous war machines, some of which were represented in exports to other countries, some converted to civil



use and a great many merely subsided into obsolescence. Therefore, I am obliged to disregard this period altogether, and to examine the growth of aviation without it, except as regards its effects on the starting points of the post-war period.

For general purposes, therefore, I am, with the reservations previously made, submitting figures of the general world growth of aviation under the following headings:—

Technical.  
Military.  
Civil.

As regards the period covered by the figures, this is not uniform, but in most cases applies to about the last ten years. Prior to the war period very few statistics are available, and civil aviation was practically non-existent.

One has not got to go back far in history to reach the beginnings of aviation; 100 years ago there was nothing of it in the world except a few scientific models and some writings; 64 years ago, at the time of the formation of this Society, a few model aeroplanes existed and two or three full-size machines had been built or projected.

It was thirty years after the formation of the Aeronautical Society that experiments on the lines which ultimately proved successful were actively pursued, in four of the countries which have become predominant in the development of aviation. History records that even at this time less than a dozen men were directing these experiments, which led a few years later to the first accredited flight by man, on December 17, 1903.

From such records as are available we may estimate that the total number of people directly interested at this time did not exceed 100. There were at the same time several scientific workers and other persons showing a mild interest. Including these we may put the total forces of aviation at a figure of not more than 200 people.

So it was not until the beginning of this century that the growth of aviation really commenced. Familiar as we may be with some of the figures, the contemplation of the results achieved in the short space of time is somewhat surprising.

### Technical Progress

Dealing first with the growth of technical progress, we have here ample and accurate data provided by the official world's records, and I must apologise for the fact that the subject matter of these curves has already been shown to this Society in connection with another paper, but they have now a few points added, and the rate of growth in terms of percentage over the previous record superimposed.

It will be noted that, taking the period of 1903 to the present day, in 27 years the main features of performance have advanced as follows:—

Distance ..	852 ft. to 4,912 miles.
Duration ..	59 seconds to 67 hours.
Altitude ..	From just clearing the ground to over 43,000 ft.
Speed ..	From about 30 m.p.h. to 357 m.p.h.

With regard to the speed of the initial flight, this has been calculated as an air speed, as the ground speed based on the time and distance works out at only 10 m.p.h. It has been reported that a 22 mile-an-hour wind was blowing at the time.

Now these records must some time reach a limit. The altitude record has already exceeded any heights useful for civil or presumably military purposes, as it is far above the height at which man can live without artificial aids to respiration and maintenance of temperature. Nevertheless, the pursuit of this record has had and will continue to have most useful effect on the design of aircraft, and particularly in the development of superchargers for aircraft engines.

The speed record also must soon begin to slow up in its rate of growth, since as we approach the speed of sound the rate of variation of resistance with speed will depart from the  $V^2$  law, and will begin to rise until it reaches a ratio where the resistance varies as the third or some higher power of the velocity, a fact which would appear to provide a very formidable barrier, despite the fact that if a power could be found to accelerate through this region the resistance falls off again until it varies, I believe, with the  $V^2$  law again.

Similarly, natural laws will set definite limits to the growth of the duration and distance record.

Probably the growth of aviation as measured by technical records has come a great deal of the total way on present lines, and new difficulties will have to be overcome before the rate of growth of the last 20 years could be maintained.

Whatever figures or other aspects may show, we see here a record of continuous and steady growth. It is satisfactory to note that, generally speaking, the rate of growth is being fully maintained at the present time. In speed, and

distance flown in a straight line, which we may regard as the most useful functions of aircraft, the growth has been accelerated in the last few years. If we assume only that the present rate will be maintained for the next ten years we can expect to see aeroplanes travelling at speeds of over 500 m.p.h., maintaining themselves for over 100 hours on the load they have lifted, and flying nearly 8,000 miles in a straight line, non-stop.

Turning to the research and educational side of technical growth, this obviously cannot be dealt with in figures.

In 1909 and 1910 the foundations of two important research institutions were laid—the National Physical Laboratory, Aeronautical Section, founded by the Advisory Committee for Aeronautics set up by the British Government—and in France the laboratory started with its wind tunnel research by Eiffel; Göttingen and Moscow also provided research laboratories, and published data during this pre-war period. From 1914 to 1918 naturally all forms of research and experiment, training and education connected with aviation were officially controlled, and of a military or naval character. One new research body, however, of great importance, the National Advisory Committee for Aeronautics in the United States of America, was started in 1915. N.A.C.A. reports are now used and known throughout the world for their conciseness and practical application. At the present time there is hardly any country which has not under approved service official control some responsible body for dealing with technical research, testing, or experimenting in aviation.

As with research, so with education. Organisation proved necessary to deal with growth of aviation. With the aftermath of the war period several of the London technical colleges turned their attention to the formation of courses with research in aeronautics. One of the older Universities—Cambridge—founded in 1919 the Mond professorship, and London followed with the Zaharoff Professorship in 1923. Now at the present time there is no lack of facilities for training either in London or the provinces. In the Dominions, both Toronto and Melbourne Universities have degree courses in aeronautical engineering with suitable wind tunnel and aerodynamics laboratory.

On the continent of Europe, the Institute for Flow-Research at Göttingen, is one of the most notable educational and research organisations. It grew originally out of the Airship Model Research Institute built in 1907, extended during the war, and its scope was widened further in 1925. The number of research staff and students in this institution now exceeds 100. Similarly Holland, Sweden, France and Italy have organised technical schools, this apart from Military Colleges.

The United States, however, shows the biggest increase in education, affecting aviation. In that country there are no less than 61 institutions offering some kind of aeronautical education and 13 of these offer full course of instruction leading to diploma or degree on aeronautical engineering.

In reviewing these facts and bearing in mind that aeronautical engineering and research employ the engineer and scientist on specialised lines, one can be satisfied that growth of aviation on research and education is solid and sound, and although perhaps not so meteoric in European countries as in the United States of America is, nevertheless, gradually building up a supply of trained engineers capable of dealing with new problems as they arise.

It is interesting to note, as illustrating the intensity with which aeronautical research is pursued, that there are now approximately some 60 wind tunnels at work in the world, probably nine tanks engaged on improvements in the hulls of flying boats and seaplane floats, and apart from private companies, 40 institutions where aeronautical research of one kind or another is being pursued.

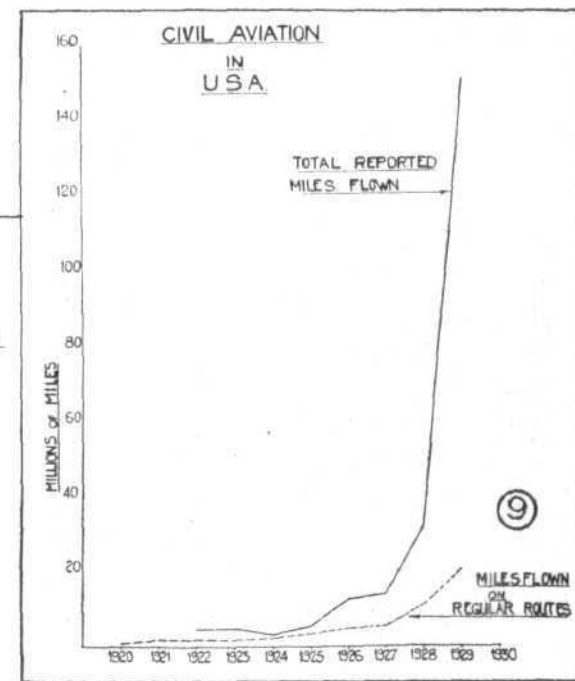
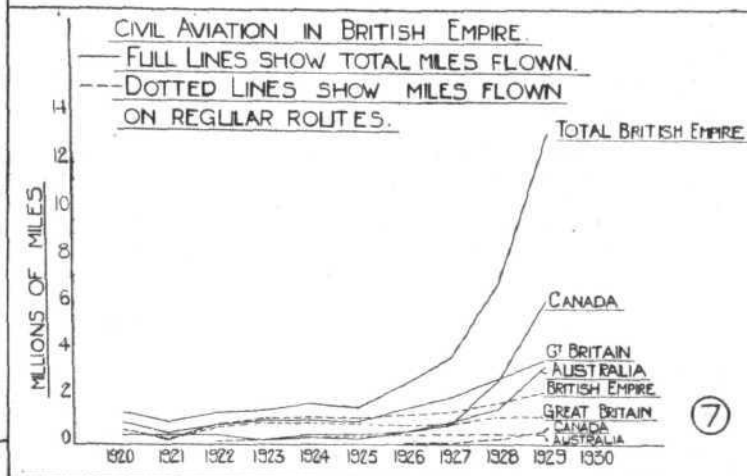
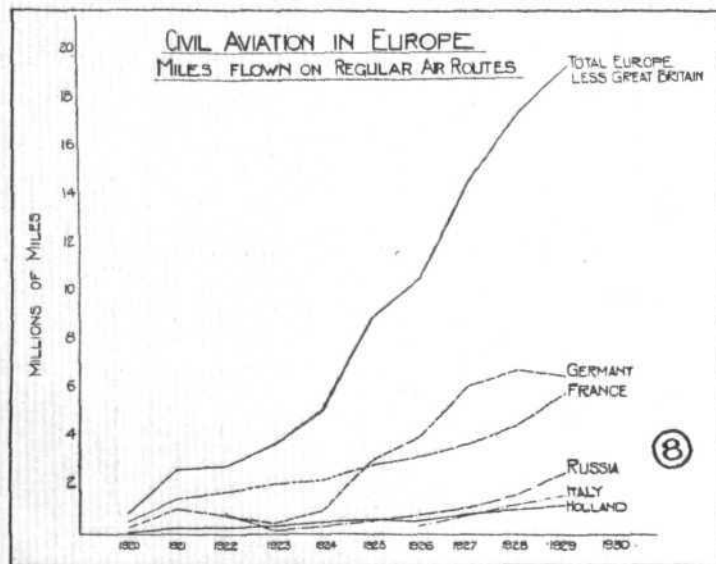
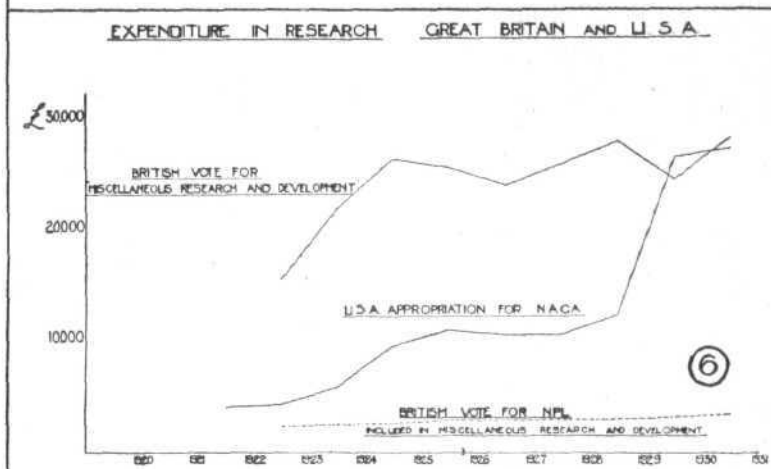
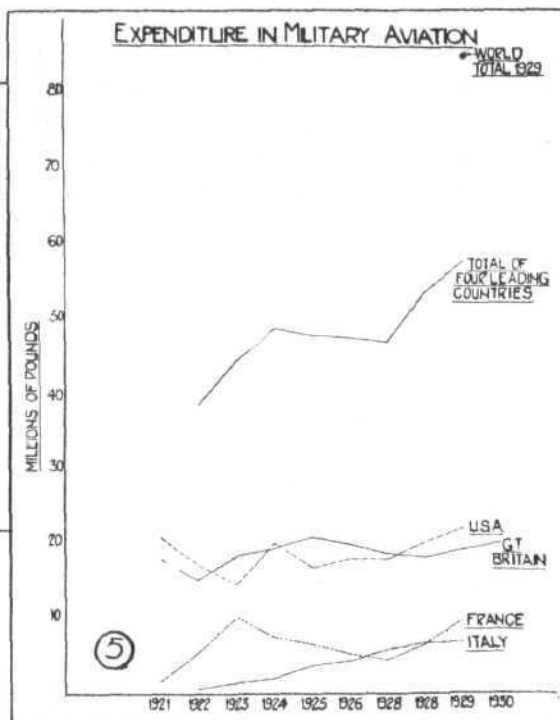
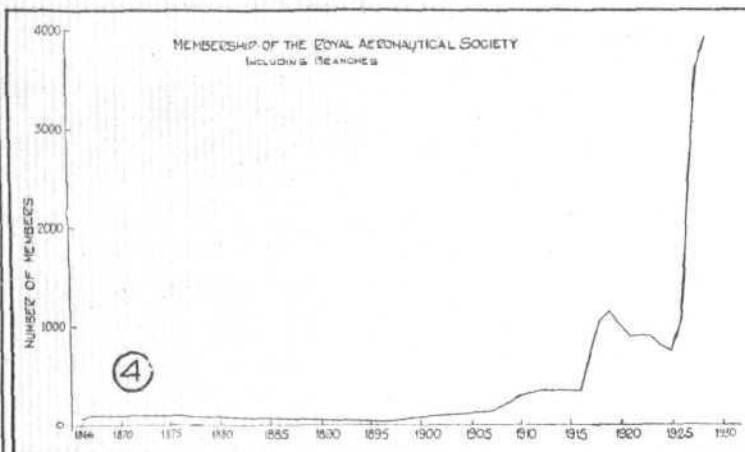
An interesting side-light on the growth of interest in aeronautical science is to consider the figures of membership of the Royal Aeronautical Society, in fact its recent stupendous growth should be a cause of greatest satisfaction.

It will be noted (Fig. 4), that from its initial membership it never exceeded 120 for 50 years, in fact its membership declined until during the few years about 1895 it had dropped to under 50 members, but from the beginning of the present century it showed a steady rate of growth until the war, a sharp increase during the war period, and a fall by 1925 although at this point it corresponds pretty generally with the rate of growth for the earlier part of the century; from that date it has never looked back, and in five years has increased its membership, including that of branches, to nearly 4,000 or over five times its number in as many years.

### Progress of Military Aviation

The expansion or decline in military aviation is, of course, in response to the political tendencies of the world, and in no





way symptomatic of the growth of aviation in the sense that we have now to consider it.

But it must be remembered that Military Votes have provided in the past and still provide, the bulk of the funds that have made possible the technical and commercial growth of modern aviation.

Military and Naval departments throughout the world have fostered the science and maintained the industry throughout the world and it is only in the last few years that an independent civil industry has come into being. Until that time it could be fairly said that aviation as a whole was entirely dependent on military requirements.

The available data for recent years by which the growth of military aviation could be judged is far from complete. Certain countries publish much, others little or nothing, and figures given on this question are submitted only as approximate, but I think the general tendencies they indicate may be taken as reliable.

At first sight the most obvious way of measuring military aviation would be by comparing the expenditure of various powers, but here again certain important considerations seriously affect the apparent results. For example, the total British vote includes the appropriation for the Near East, where the Royal Air Force is engaged very economically in doing necessary police work that at one time was carried out by the Army.

It includes also support of Meteorological and other services of general utility to all aviation, and large sums spent on research and development of untold value to aviation as a whole. It also includes contributions to such institutions as the National Physical Laboratory and the support of such important services as that of the Aeronautical Inspection Department, on whom falls a great part of the burden of maintaining the efficiency and reliability of British aircraft and which, if not supported by a Military Vote, would manifestly have to be maintained in some way or other.

Moreover, the figures show a slight reduction in British military aviation expenditure since 1925, but it is obviously indisputable that in that period military aviation has advanced enormously in this country in the perfection of its organisation and in the performance and equipment of its aircraft, and in the training of personnel, in fact in every branch of the Royal Air Force activities, with the result that this graph of expenditure should, if it were possible, be shown in relation to a curve depicting the increased efficiency of the Royal Air Force for the same period.

How far these facts may apply to other countries I do not know, but manifestly aviation in other countries benefits also from its military expenditure even if they do not duplicate the beneficent fostering of the science that is carried out by the Air Ministry of this country.

Fig. 5 depicts the Military expenditure of the four great powers, for Russia no information is available, but according to report its Air Force is possibly as large as that of any of the Powers.

The curve for Great Britain is the total vote minus only the amounts directly spent on civil aviation, and including all the items previously mentioned that are not solely military expenditure. Similarly the bulge in the American curve in 1924 is caused by an appropriation for carrier ships.

It will be noted that these curves show an increasing tendency in the past two years, though to a much less extent in Great Britain than in any other countries, but as mentioned previously expenditure is not a true index of growth, and in efficiency military aviation has increased tremendously in the last few years, particularly in Great Britain.

Nevertheless, in terms of the expansion we have been considering for civil aviation, military aviation is growing very slowly, and the rate of growth is apparently declining, and presumably, as time goes on, it is to be expected that if military votes are maintained at their present level a greater proportion of them will be expended on research, and other services, at least that is the tendency in this country and America.

As regards world totals, I regret that I am unable to offer figures for the past years, but a computation for the year 1929 gives a total sum of military vote equivalent to £86,000,000.

A similar estimate for personnel employed in military aviation for the world gives a total of 125,000.

### Progress of Civil Aviation

We now come to the most interesting and important feature of the world growth of aviation, that of civil operations. Apart from the activities of the pioneers, civil aviation dates only from the termination of the war, and about 10 years ago many enterprises throughout the world were launched unassisted to inaugurate the world's air routes.

Some of these, notably the air lines run by the late Mr. Holt Thomas and Mr. Handley Page, made good progress towards a commercial basis before the necessity of Government assistance became apparent. Today a large proportion of the world's regular air routes are subsidised or assisted, but, as the figures will show, commercial aviation is making steady progress towards a self-supporting basis. Unsubsidised aviation concerns and private flying have had only a few years' existence, but these, as we shall see, have made the most rapid advance of any.

For civil aviation a great mass of data is available, and a variety of statistics covering many activities are now published.

Mileage on regular air routes is easily obtainable and quite reliable; totals of passengers, mails, and goods carried are faithfully recorded; nearly everywhere civil machines are registered, and total mileage on these routes can be given with reasonable accuracy.

Figures for joy-riding concerns, schools, light aeroplane clubs, other air services, and private flying manifestly have to be estimated, but here there are available many published estimates by various authorities for comparison.

The accuracy of the data available varies with countries and in some is available over 10 years, in others only a few. Incidentally, in considering the available figures, one is impressed with the fact that the United States of America would appear to be the true home of statistics.

I propose to take as one of the best indications of progress the total mileage flown, and to consider first the figures for Great Britain, including the British overseas routes, Australia, and Canada.

Great Britain shows a steady and nearly uniform growth for the past few years and reaches a total of nearly 3,700,000 miles in 1929, of which, roughly, 1,200,000 is on regular air routes.

Australia, starting with less than one-third of the British mileage in 1922, had practically equalled it by 1929, reaching a total of nearly 3,500,000 miles, of which 478,000 was on regular air routes.

Canada, with less than 200,000 in 1923, did not pass Great Britain's total until 1928, but nearly doubled it last year, reaching a total of 6,284,000 miles, of which 491,000 was on regular air mail routes alone. The data obtainable for commercial aviation in Canada does not enable us to separate mileage figures for transport over scheduled service from those for special charter and miscellaneous operations, but an estimate based on data just to hand given by individual companies gives about 1,450,000 miles flown on organised routes, including air-mail operations. In the charts the figure for regular air-transport mileage is that of the air mail only.

It is in these three countries that the bulk of civil aviation in the British Empire takes place, and the outstanding fact revealed by the figures is the extraordinarily rapid expansion in Australia and Canada in the past two years.

The rate of growth was no greater in these countries than in the rest of the world until 1927, but from that date a rate of expansion takes place which is far higher than anywhere else in the world except the United States of America.

Also it is to be noted that it is flying other than that on regular air routes that is responsible for this growth; the regular air routes show a slow but steady growth, other aerial activities show this remarkable expansion.

Taking the British Empire as a whole—or rather, Great Britain, Australia, and Canada together—the present ratio of total to regular air route flying is about 6 to 1, but taking Australia and Canada together the ratio is 10 to 1, taking for Canada only the subsidised air mail mileage.

The curve for the British Empire as a whole, due chiefly to the influence of Australia and Canada, shows similar characteristics, and it will be noted that the total flying by the end of 1929 had reached a figure of over 13,000,000 miles.

Now, turning to the figures for Europe, I am obliged here to take the regular air routes only owing to the total lack of data on private flying and other services, but I think it is fair to assume that this would form a small proportion as compared with the British Empire or America. The curves (Fig. 7) show mostly a slow but steady growth, Russia and France showing a slight expansion last year but Germany actually a slight decline. The total figure reaches just over 19,000,000 miles all, it is to be noted, flown on regular air routes, but in this case the growth is nearly a straight line and the curve for the total is slightly convex.

Now let us look at America. Here statistical data is available for total flying over the past eight years and for regular air routes over the past 10 years, and the results are certainly remarkable.

With a regular air route mileage of only 880,000 miles in



1920, this had been little more than trebled by 1925. By 1927 it had reached 5½ millions, and by 1929, the end of the period considered in all these figures, had risen to the total of over 20,000,000 miles on regular air routes alone.

But it is when we come to consider the figures for total flying in America (Fig. 8) that the most amazing growth is to be noted, and as this figure affects so vitally the world's totals it requires some explanation as to how it is arrived at.

The estimated total of commercial flying other than regular air routes in America for the year ending 1929, reaches a figure of 104,000,000 miles, and this total is put forward with reserve but is compiled from data accumulated by the American Aeronautical Chamber of Commerce.

The mileage is made up from reports of 75 typical operators, and includes all aerial service concerns in the United States listed by the Aeronautical Chamber of Commerce. This includes 633 concerns doing short flights and charters, 94 doing aerial advertising, 11 engaged on crop dusting, 50 in exhibition flying, 164 doing aeronautical photography and measuring, and 419 operating flying schools.

The total machines concerned for the year amounted to 7,595. It is interesting to note that of these, 7,408 were single-engined landplanes, 49 tri-motored landplanes, and 238 seaplanes. The estimate is based on total flying hours of over 1,300,000.

This is equivalent to 170 hours per machine, which would not appear to be high, and it is to be remembered that this is for unsubsidised services, which have to work hard to be on a profit-making basis, and the large number of schools

concerned would certainly account for more than 170 flying hours per machine per annum.

Moreover, the equivalent figures for Australia and Canada are 226 and 195 hours respectively, which appear to compare very well. Thus judging by machine mileage ratio and total to subsidised mileage ratio the American total would appear to be reasonably probable.

In addition to these figures for commercial flying, private flying in 1929 amounted to 25 million miles, according to American estimates.

An interesting point is arrived at by computing the ratio of total to regular subsidised air route mileage, as was done for British Dominions. This reveals a ratio of 9 to 1, showing a close similarity.

Accepting these figures, we come to the total mileage for American flying of 150 million miles for last year, an increase of 375 per cent. over that of 1928, and a figure equivalent to 80 per cent. of the total flying mileage of the world.

I would like to draw attention to the similarity between the shape of the curve of the total flying in America and those for Canada and Australia. Each curve shows steady growth up to about three years ago, a decided increase for 1928, and then this rapid expansion in 1929.

Meanwhile the curves for the rest of the world continue with a relatively slower but regular advance.

Moreover, this expansion is not in subsidised or regular air route flying, but is in various flying services and private aviation, and these curves would appear to indicate very decisively the fields of aerial activity of the future and the markets for the aviation industry.

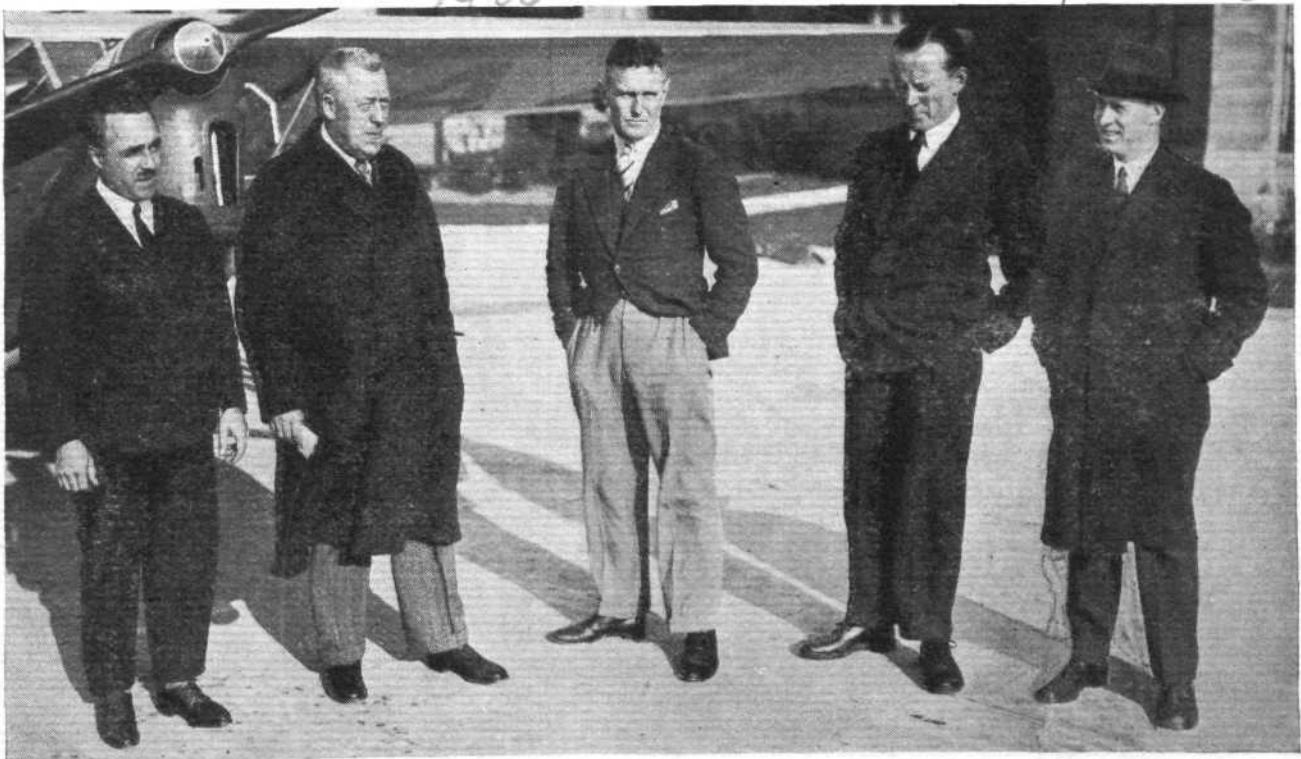
(To be concluded.)

## MORE ABOUT PARACHUTES

*Parachuting.* By Charles Dixon (ex-Observer, R.N.A.S. and R.A.F.). Author of "Amy Johnson," "Parachutes for Airmen." (Sampson Low, Marston and Co., Ltd. Obtainable from FLIGHT office, 12s. 6d. net.)

Mr. Dixon has speedily followed up his first book on parachutes with a more comprehensive work on the same subject, treating it in a somewhat different way. In this book he starts with a historical review, and attributes the idea of the parachute to Leonardo da Vinci. He traces the early experiments, and goes on to set down nearly everything which can be said about the parachute as a saver of human lives.

Always he insists that there is nothing unpleasant about a parachute drop, though many will find it hard to accept that without experience. Still, the parachute has amply proved its worth as part of the equipment of service airmen. There is not the same necessity for passengers in a civil aircraft to be so equipped, and in any case the problem of making it possible for a passenger in a cabin to escape by parachute has not yet been solved. Everyone, however, ought to know something about the subject of parachutes, and Mr. Dixon's book provides the information in a very pleasant manner.



**DR. ECKENER FLIES TO FLUSHING:** A special 3-seater Desoutter Sports Coupé was placed at the disposal of Dr. Eckener and Capt. von Schiller on October 13 to take them from Croydon to Flushing—Dr. Eckener having missed his boat train through being delayed in connection with the R 101 disaster. The machine piloted by Capt. Styran left Croydon at 2.15 p.m. and, with a short halt at Lympne, reached Flushing at 4 p.m. Our picture shows, from left to right, Mr. Marcel Desoutter, Dr. Eckener, Capt. Styran, The Master of Sempill, and Capt. von Schiller.

# THE ROYAL AIR FORCE

London Gazette, October 7, 1930

**General Duties Branch**

The following are granted permanent commns. as Pilot Officers, with effect from Sept. 27 and with seniority of dates stated:—Flying Officer H. St. G. Burke (R.A.F.O.) (Mar. 27, 1929); Pilot Officer T. B. Cooper (R.A.F.O.) (Sept. 27, 1929); H. Ford (Sept. 27, 1929); Pilot Officer P. E. Hudson (R.A.F.O.) (Mar. 27, 1929); G. E. W. Parish (Sept. 27, 1929); Pilot Officer W. R. Sadler (R.A.F.O.) (Sept. 27, 1929).

Lt. F. C. Tracey (Yorks and Lancs Regt.) is granted a temp. commn. as Flying Officer on being seconded for duty with R.A.F. (Sept. 27). Sqdn.-Ldr. J. Noakes, A.F.C., M.M., is restored to full pay from half-pay (Oct. 6). Lt. S. T. Morgan, R.N., is re-attached to R.A.F. as Flying Officer, with effect from Dec. 10, 1929, and with seniority of June 16, 1924. (Substituted for *Gazette* Jan. 7, 1930.) The following Pilot Officers are promoted to rank of Flying Officer (Aug. 22):—C. S. Gill, V. R. Moon, F. R. W. Goad, E. D. Bishop, E. A. Cooke, T. H. Wilson, G. H. A. Blackwood, T. W. Hoyle. Sept. 15.—J. D. Baker-Carr.

Wing-Comdr. J. C. Russell, D.S.O., is granted the acting rank of Group Captain while commanding Station H.Q., Amman (April 10). Sqdn.-Ldr. A. FitzRoy Somerset-Leeke, O.B.E., is seconded for duty as Technical Adviser to the Greek Air Ministry and is granted acting rank of Wing Commander while so employed (Sept. 23). Pilot Officer D. W. Smythe takes rank and precedence as if his appointment as Pilot Officer bore date May 22, 1929. Reduction takes effect from Sept. 18. Flying Officer L. S. Tindall is transferred to Reserve, Class A (Sept. 24).

Flying Officer A. W. H. Nelson relinquishes his short service commn. on account of ill-health (Oct. 1). The short service commn. of Pilot Officer on probation L. Sloman is terminated on cessation of duty (Sept. 17).

**Stores Branch**

Flight Lt. H. V. Robbins is placed on retired list (Oct. 6).

**Accountant Branch**

Flight Lt. E. C. Green is placed on retired list on account of ill-health (Oct. 8).

**Medical Branch**

The undermentioned officers are granted permanent commns. in ranks stated (Oct. 8):—*Flight-Lieutenants*.—R. E. Alderson, M.B., B.S.; G. W. Paton, M.B., Ch.B.; P. B. L. Potter, M.B., Ch.B.; S. B. S. Smith, L.M.S.S.A. *Flying Officers*.—N. M. Jerram, M.R.C.S., L.R.C.P.

**Dental Branch**

Flight Lt. (Hon. Sqdn.-Ldr.) E. A. Wheeler, L.D.S. (Temp. Major, General List, Army, Dental Surgeon), is transferred from the Army to the R.A.F. (July 1). (Substituted for *Gazette*, Sept. 30.)

**RESERVE OF AIR FORCE OFFICERS****General Duties Branch**

H. P. L. Higman is granted a commn. in Class C as Flying Officer (Oct. 7). Flying Officer H. W. Knott is transferred from Class A to Class C (Aug. 16). Flight Lt. B. C. Adamson relinquishes his commn. on completion of service, and is permitted to retain his rank (Sept. 12).

The following relinquish their commns. on appointment to permanent commns. in R.A.F. (Sept. 27):—Flying Officer H. St. G. Burke, Pilot Officer T. B. Cooper, Pilot Officer W. R. Sadler, Pilot Officer P. E. Hudson. Flying Officer W. C. Kilvington (Major, R.A.R.O.) resigns his commn. (Oct. 8).

**Stores Branch**

Flying Officer H. C. Haywood-Gibbons relinquishes his commn. on completion of service, and is permitted to retain his rank (Sept. 12).

**Medical Branch**

Flight Lt. J. A. Quin, M.D., B.A., relinquishes his commn. on account of ill-health (Oct. 8).

**Royal Air Force—New Appointments**

The Air Ministry announce the following appointments:—The Reverend Sidney Lampard Clarke, M.A., B.Sc., to be Chaplain-in-Chief to the Royal Air Force with effect from December 11, 1930, in place of the Reverend Robert Edward Vernon Hanson, O.B.E., M.A., K.H.C., on the latter being placed on the retired list.

Matron Miss Katherine Christie Watt, R.R.C., to be Matron-in-Chief, Princess Mary's Royal Air Force Nursing Service with effect from November 29, 1930, in place of Miss Joanna Margaret Cruickshank, C.B.E., R.R.C., on the latter being placed on the retired list.

**The Royal Air Force Memorial Fund**

The usual meeting of the Grants Sub-Committee of the Fund was held at Idlesleigh House, on October 2. Mr. W. S. Field was in the chair, and the other members of the Committee present were:—Mrs. L. M. K. Pratt-Barlow, O.B.E., Air-Commodore B. C. H. Drew, C.M.G., Sqdn.-Ldr. A. H. Wann. The Committee considered in all 14 cases, and made grants to the amount of £246 1s. 11d.

**Annual Report, Meteorological Office**

The annual report of the Director of the Meteorological Office, presented by the Meteorological Committee to the Air Council, for the year ended March 31, 1930, has just been issued. This report describes the activities of the Meteorological Office during the seventy-fifth year of its existence and the tenth year in which its cost has been borne on Air Ministry votes. The year was one of great activity in international co-operation and, as well as meetings of several commissions, the report includes accounts of three important conferences—the International Conference on the Safety of Life at Sea, which met in London during April and May, 1929, the Conference of Empire Meteorologists in London in August, and the International Conference of Directors of Meteorological Services at Copenhagen in September. These conferences led amongst other things to the recognition of marine meteorology in international treaties, to a radical improvement in the interchange of meteorological data throughout the world, and to a much closer connection between the meteorological services of the British Empire. In the actual work of the office during the year outstanding features were the adoption by the Forecast and Aviation Services on March 1, 1930, of the new international code for the transmission of meteorological messages, which was approved at the Conference of Directors at Copenhagen, and the arrangements made for the Airship Services Division in connection with the trials of H.M. Airships R.101 and R.100. Copies of the report may be obtained from H.M. Stationery Office, price 1s. net.

**IMPORTS AND EXPORTS**

**AEROPLANES**, airships, balloons and parts thereof (not shown separately before 1910).

For 1910 and 1911 figures see FLIGHT for January 25, 1912.

For 1912 and 1913, see FLIGHT for January 17, 1914.

For 1914, see FLIGHT for January 15, 1915, and so on yearly, the figures for 1927 being given in FLIGHT, January 17, 1930.

Imports.		Exports.		Re-exports.	
1929.	1930.	1929.	1930.	1929.	1930.
£	£	£	£	£	£
Jan. . . 2,852	2,987	74,307	147,935	100	—
Feb. . . 6,532	2,460	195,369	226,049	2	1,000
Mar. . . 1,210	744	204,664	156,098	90	802
April . . 5,816	2,959	186,477	213,390	115	79
May . . 4,706	11,706	243,549	158,460	1,245	2,550
June . . 9,304	15,029	144,817	252,443	750	1,060
July . . 6,961	14,216	139,695	170,594	—	938
Aug. . . 16,706	5,382	160,625	146,564	4	6,912
Sept. . . 510	2,757	237,303	109,36	9,686	1,730
54,597	58,240	1,586,806	1,580,896	11,992	15,071

**NEW COMPANIES REGISTERED**

**THE LEICESTERSHIRE AERO CLUB, LTD.**, 3, Granby Street, Leicester.—A company limited by guarantee, without share capital, with not more than 650 members, each liable for 5s. in the event of winding up. The objects are to acquire the assets and liabilities of the unincorporated association known as "The Leicestershire Aero Club," and to promote and encourage aviation in any form, etc. The management is vested in a Committee, the first members of which are: W. Lindsay Everard, M.P., Ratcliffe Hall, Leicestershire; E. T. Walker, Ratcliffe Road; T. T. Sawday, Meadowcourt Road; W. H. Hubbard, Guilford Road; R. C. Winn, Knighton Drive; H. Purr, Knighton Road; B. Franklin, 73, Sparkenhoe Street; E. S. Harding, The Fairway, Manor Road; all of Leicester (permanent life members), and seven others. Secretary: H. Purr.

**SKYADCO, LTD.**, 139, High Road, East Finchley, N.2.—Capital £100 in £1 shares. Acquiring, etc., the use of the aero banner winding gear attachment British patent No. 333,350, and such other letters patent as may be secured for it overseas. General outdoor publicity agents and contractors, etc. Directors: W. Alliston, 13, Buckingham Avenue, Whetstone, N.20 (director of Alliston Aviation Co., Ltd.); W. Bramble, 139, High Road, East Finchley, N.2; J. B. Dugmore, 96, Bedford Road, East Finchley, N.2.

**AERONAUTICAL PATENT SPECIFICATIONS**

(Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors. The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

**APPLIED FOR IN 1929**

Published October 16, 1930

- 18,827. H. R. RICARDO. Fuel-injection apparatus for i.c. engines. (335,207.)
- 19,044. ARMSTRONG SIDDELEY MOTORS, LTD., and S. M. VIALE. Gearing for superchargers used with i.c. engines. (335,250.)
- 19,988. D. R. POBJOY. Cowling air air-cooled i.c. engines. (335,285.)
- 27,119. CHANCE BROS. AND CO., LTD., and W. F. A. RICHEV. Navigational lights. (335,355.)
- 29,199. BOEING AIRPLANE CO. Flare-releasing mechanism. (335,372.)
- 31,159. H. JUNKERS. Cylinders of reciprocating i.c. engines. (335,399.)
- 32,972. P. J. P. RATIER. Metallic screw propellers having variable pitch in flight. (335,422.)
- 34,181. T. CASPAREUTHUS. All-metal screw propellers. (335,430.)
- 34,370. A. L. F. WATTEL. Fastenings for parachute belts, etc. (335,431.)
- 35,832. Sir B. H. MORGAN and G. F. JONES. Air-cooled i.c. engines. (335,446.)
- 35,914. G. CAPRONI. Chaser aeroplanes with sighting-device for firing forward and rearward. (335,448.)
- 35,917. G. CAPRONI. Multiple installations of machine-guns on aeroplanes. (335,449.)

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Telephone: Holborn, 1884;

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